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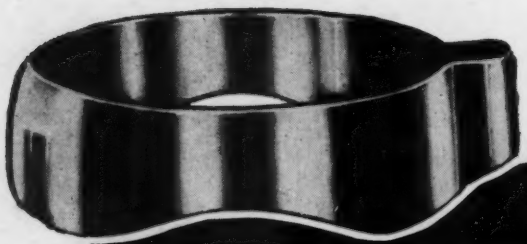

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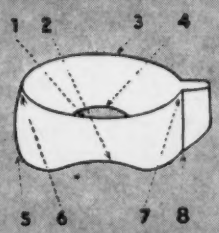

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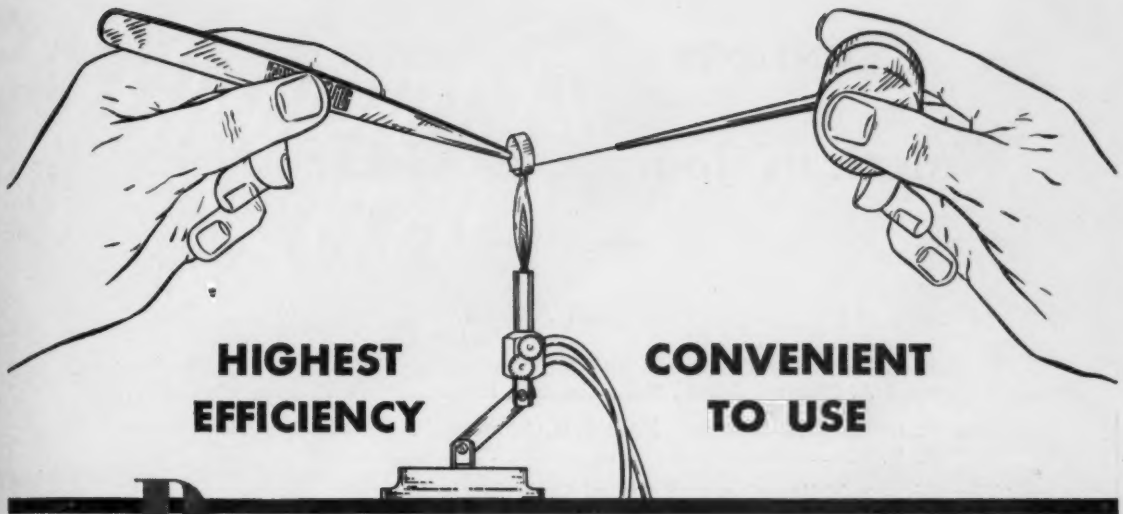

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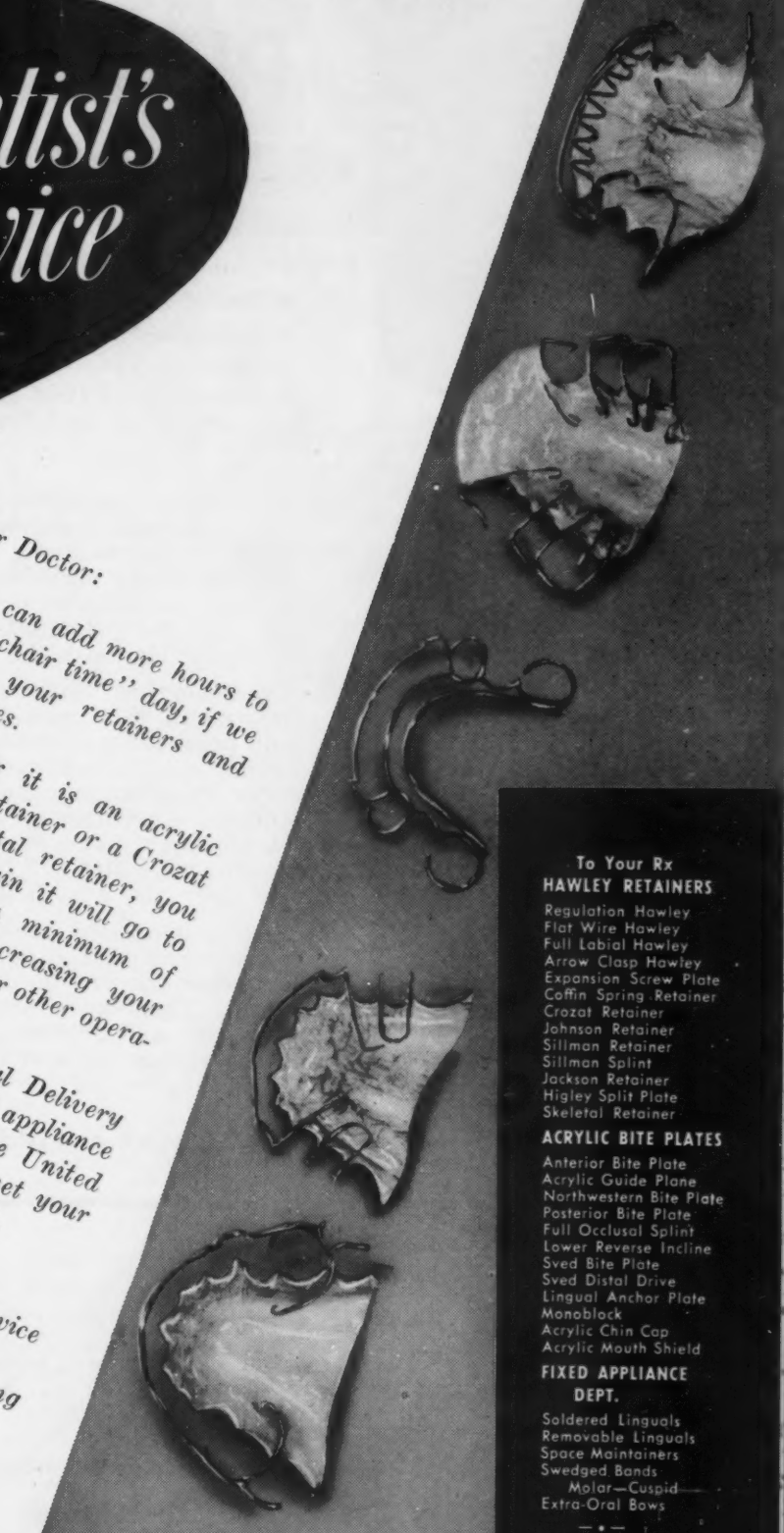

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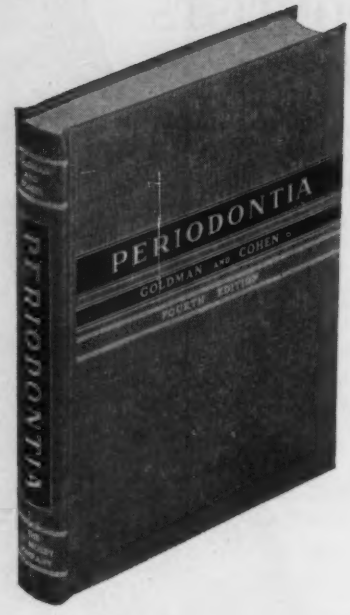

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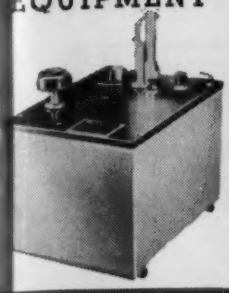

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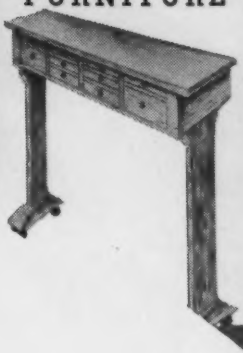

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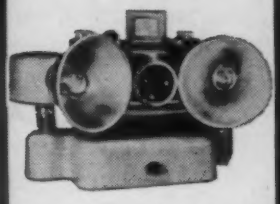

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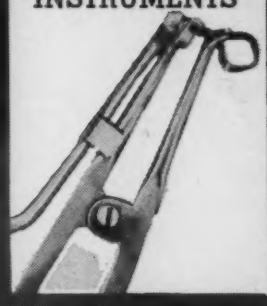

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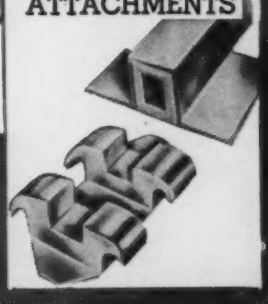

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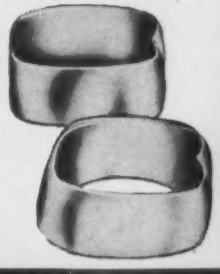

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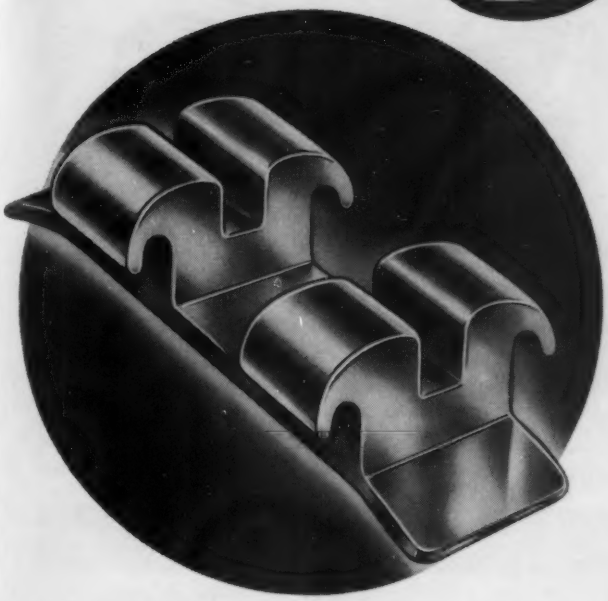

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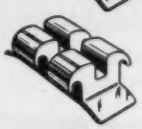

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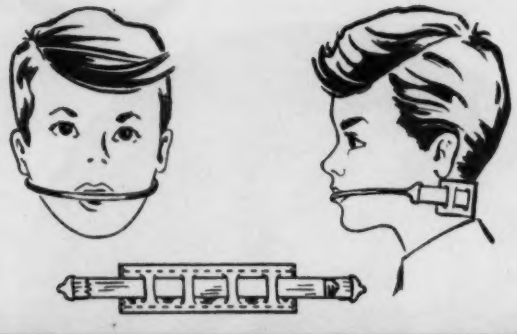

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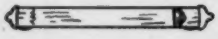

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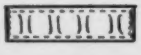

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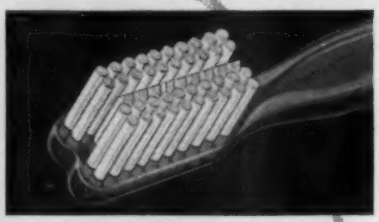

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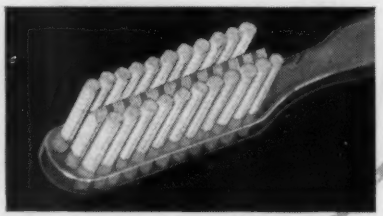

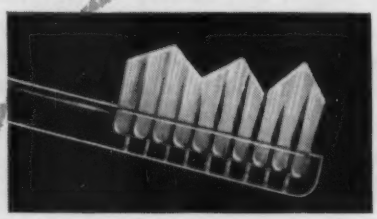

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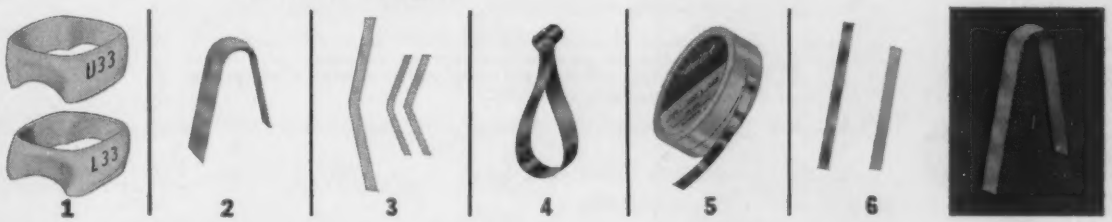

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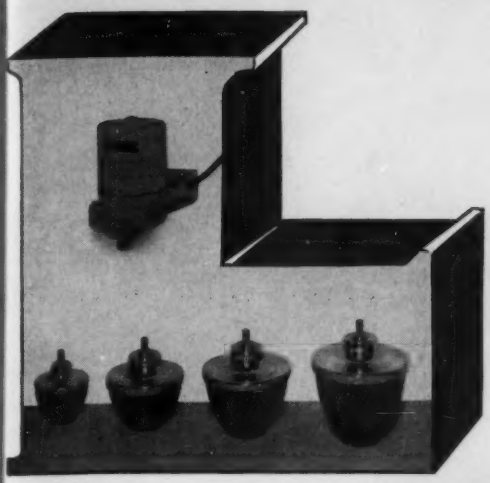

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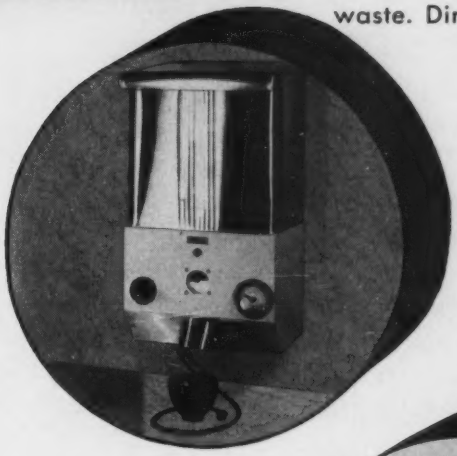

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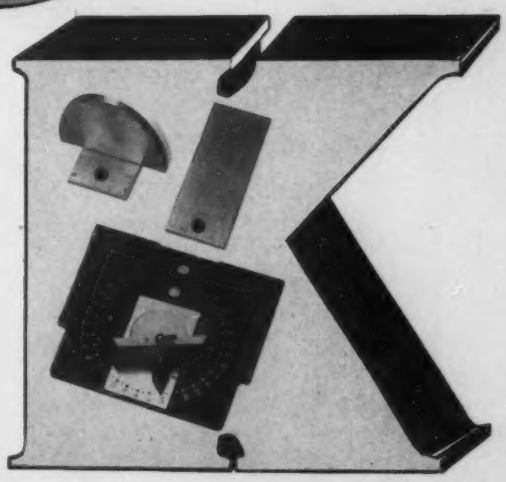

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Practice Administration for THE DENTIST

Edited by **WILLIAM R. MANN, M.S., D.D.S.**, Ann Arbor, Michigan. Associate Professor of Dentistry, School of Dentistry, and Associate Director, W. K. Kellogg Foundation Institute; Graduate and Postgraduate Dentistry, University of Michigan.

and **KENNETH A. EASLICK, A.M., D.D.S.**, Ann Arbor, Michigan. Professor of Dentistry, School of Dentistry, University of Michigan.

1955, 386 pages, 6¾" x 9¾". PRICE, $8.50.

This volume provides a summary of the fundamentals necessary for the efficient, ethical practice of dentistry, for professional improvement, and for participation in community life—a long uncharted area of professional concern. It is the outgrowth of the workshop held at the University of Michigan. Those who attended represented 31 states, the District of Columbia, and four provinces of Canada. Instructors from 26 dental schools were in attendance.

At this workshop dentists, dental hygienists, dental assistants, dental teachers, and others interested in the subject critically presented the data, information, and opinions available regarding the entire area of practice administration and determined the best patterns for the dentist to adopt in organizing and administering his practice and for filling his niche of professional responsibility in his community.

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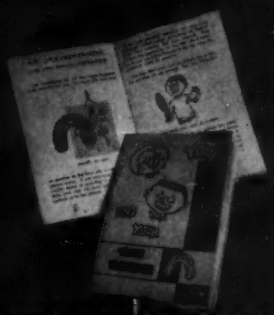

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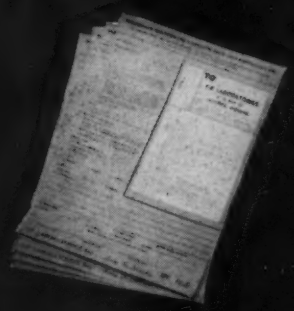

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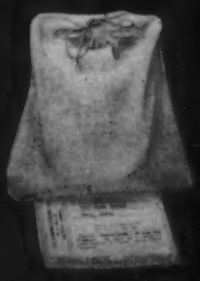

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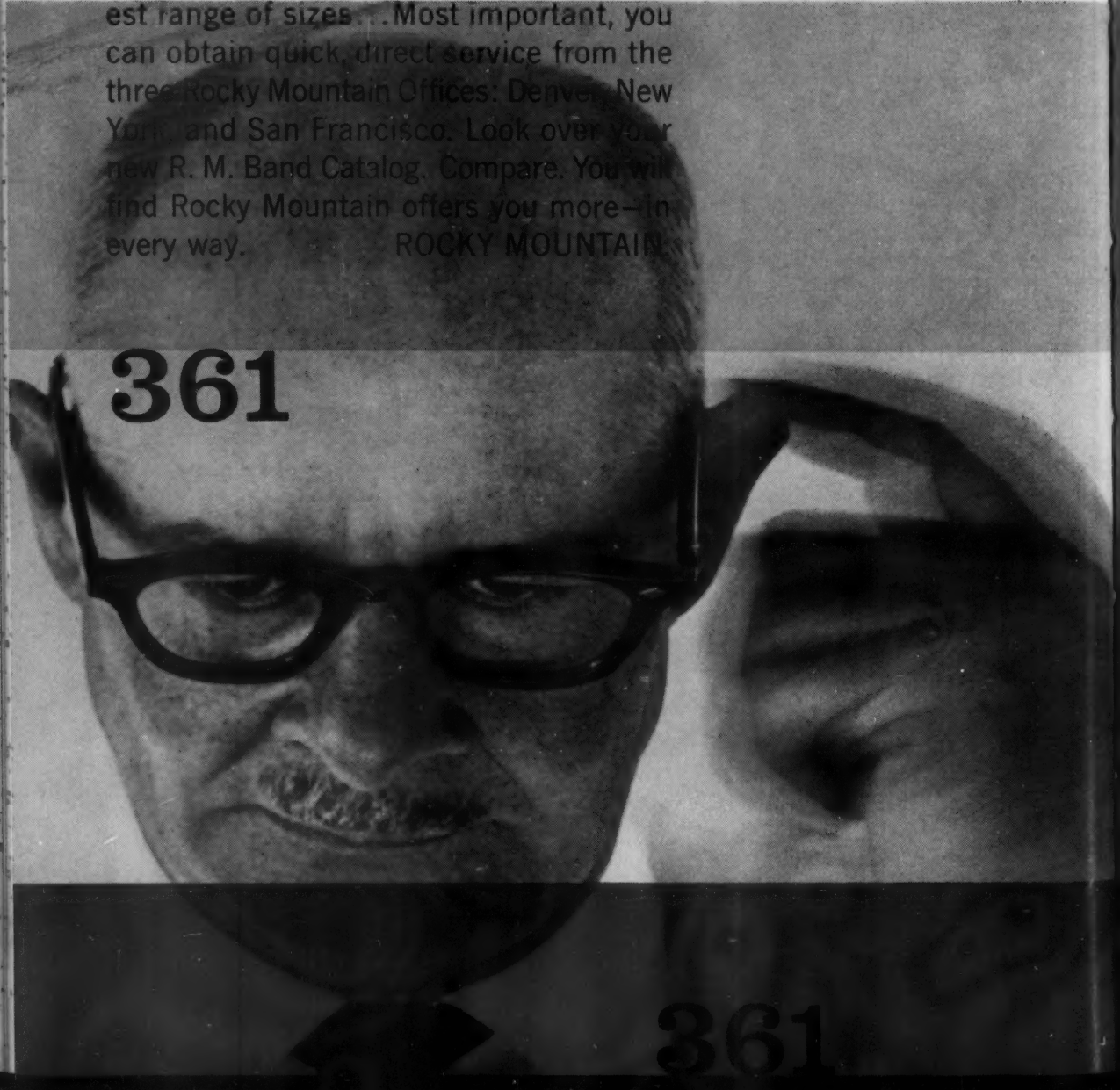

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VOL. 44 NOVEMBER, 1958 No. 11

Original Articles

FACTORS IN THE EARLY TREATMENT AND INTERCEPTION OF MALOCCLUSION

EDWARD A. CHENEY, D.D.S., M.S., LANSING, MICH.

ONE of the most important considerations relative to early treatment and interception of malocclusion is the extent of balance in the dentofacial complex. By balance, I mean the amount of harmony in the size, the shape, and the functional relationships in and between the various parts of the dentofacial complex. The extent of balance is important, for it determines the limits as well as the opportunities for early treatment and interception. In *balanced* dentofacial structures, early treatment and interception are sufficient to permit the development of satisfactory and ideal occlusions. On the other hand, in *unbalanced* dentofacial structures, early treatment and interception are not sufficient to enable the dentition to develop satisfactory and ideal occlusions through growth alone; later orthodontic management is required. In this article I shall elaborate and illustrate these points of view. First, however, it seems advisable to define "early treatment and interception" and "balance in the dentofacial complex" as they are used here.

"Early treatment" is orthodontic management of growing dentitions. It is treatment applied before the completion of the early permanent dentition. An early permanent dentition is one that possesses all the permanent teeth except the second and third molars. In some children the second molars are present. Most orthodontists would give a similar definition of the early permanent dentition.

Presented before the Northeastern Society of Orthodontists, Buffalo, New York, October, 1957.

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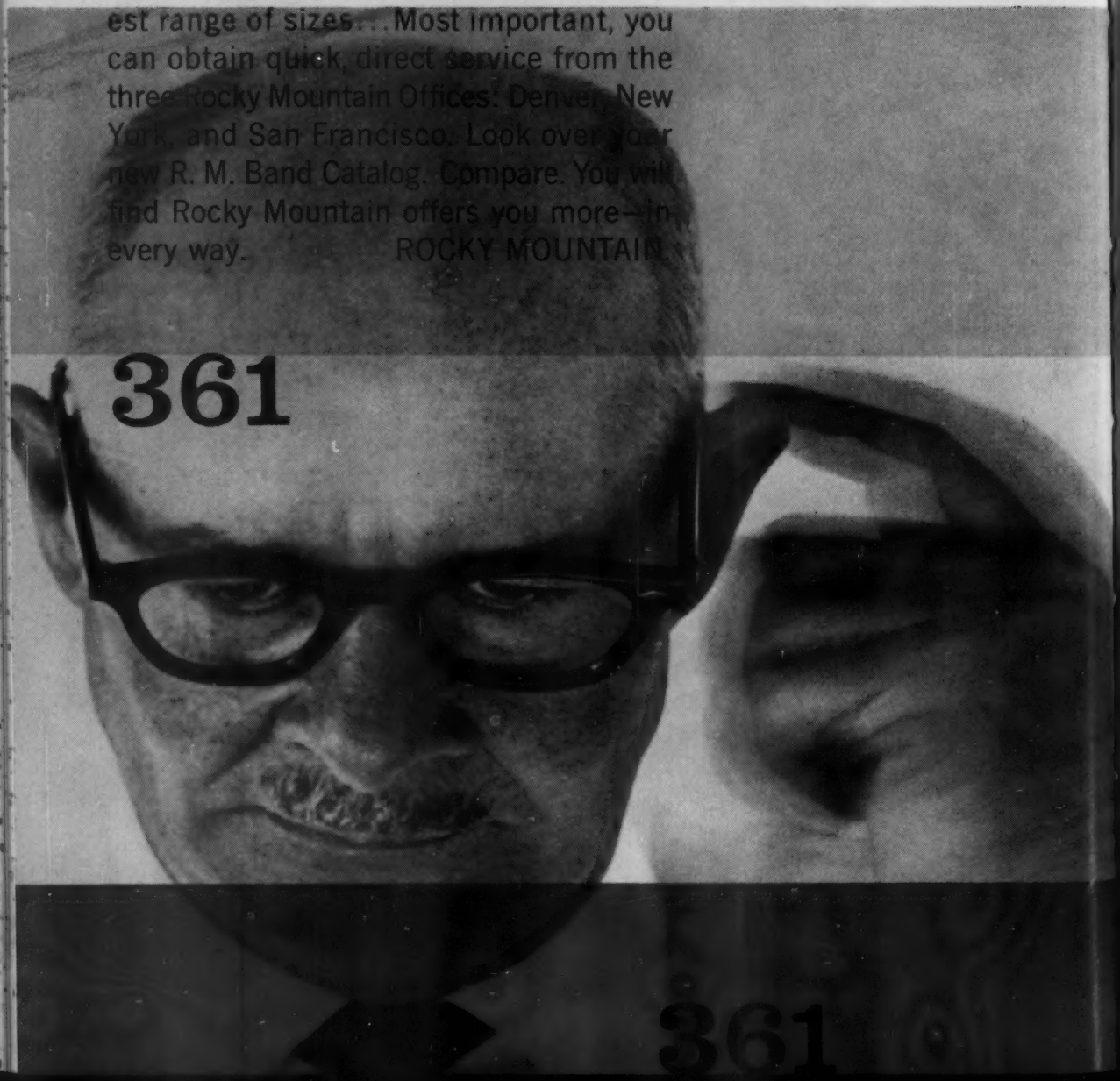

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"Interception" is another term that will be used extensively. In this article, it means the control of factors which act to modify dentofacial growth in an undesirable manner. The interception of malocclusion is effected through early treatment.

"Balance in the dentofacial complex" requires a more extensive explanation and description. Since the days of Angle, everyone has been talking about dentofacial balance. Almost everyone has his own idea about it, and that is the way it should be. The extent of dentofacial balance is a major consideration in the diagnosis of every malocclusion. It is necessary to understand this phase of the orthodontic problem before we can think in terms of treatment procedure. In my opinion, an evaluation of the extent of dentofacial balance is most meaningful when it is considered in terms of the various structural parts of the face. By structural parts, I mean the bones of the face, the teeth, and the muscles of function.

To define balance in the bones of the face, I shall refer to the skull shown in Fig. 1. It is the skull of a male Negro. The dentition sits forward in the facial mass, a position typical of the Negro race. There are several ways of defining the extent of balance in this skull. In order to implement the discussion in this article, I wish to refer to a direct method of observation which I call the "facial form analysis." The facial form analysis is based on a series of anthropologic observations, which are made to study relationships between the various bones of the face. They are made in three dimensions: the anteroposterior, the lateral, and the vertical relationships in the size, shape, and form of bony parts. The lines shown on the skull in Fig. 1 are used to study anteroposterior balance of vertical facial parts. The horizontal line, which passes through porion and orbitale, is called the *Frankfort plane.* The vertical plane passes through nasion and is perpendicular to the Frankfort plane; it is called the *nasion perpendicular plane.* Four points on the anterior facial mass are studied relative to the nasion perpendicular plane. These points which are shown in Fig. 1, are identified as *M.F.*, *S.P.*, *I.P.*, and *M.* *M.F.*, an abbreviation for midfacial point, is located on the living patient by palpating the anterior border of the maxilla at the lower lateral border of the ala of the nose. This point localizes the lower lateral margin of the nasal aperture. As shown on the skull, point *M.F.* marks the anterior margin of the maxilla at the level of the upper root apices.

The anterior border of the mandibular apical base is localized at point *M.* This is the lowermost anterior point of the mandible and is called menton. In the facial form analysis we refer to it as chinpoint. As we study the anteroposterior relationship of points *M.F.* and *M.* on the skull in Fig. 1, one fact is evident: These points are an equal distance anterior to the nasion perpendicular plane. This is another way of saying that there is anteroposterior balance of the upper and lower apical bases as they support their respective dentitions.

S.P. and *I.P.*, abbreviations for superior prosthion and inferior prosthion, mark the anterior borders of the upper and lower dentoalveolar structures.

As you study *S.P.* and *I.P.* points, you can see that *S.P.* is anterior to *I.P.* by the same amount that the upper incisor crown overlaps the lower incisor crown. Except for the overlapping, which we expect, the dentoalveolar points follow and reflect the extent of balance of the apical base levels. In this skull the balance is ideal. On the other hand, as you study the position of these four points on the anterior border of the faces of your patients, much variation will be evident. The anteroposterior relationship of these four points varies considerably from one patient to another. In some patients the points will be posterior to the nasion perpendicular plane. In other patients the points will fall on this vertical plane. In any case, however, when the apical base points ***M.F.*** and ***M.*** are an equal distance anterior or posterior from the nasion perpendicular plane, there is anteroposterior balance of the skeletal bases.

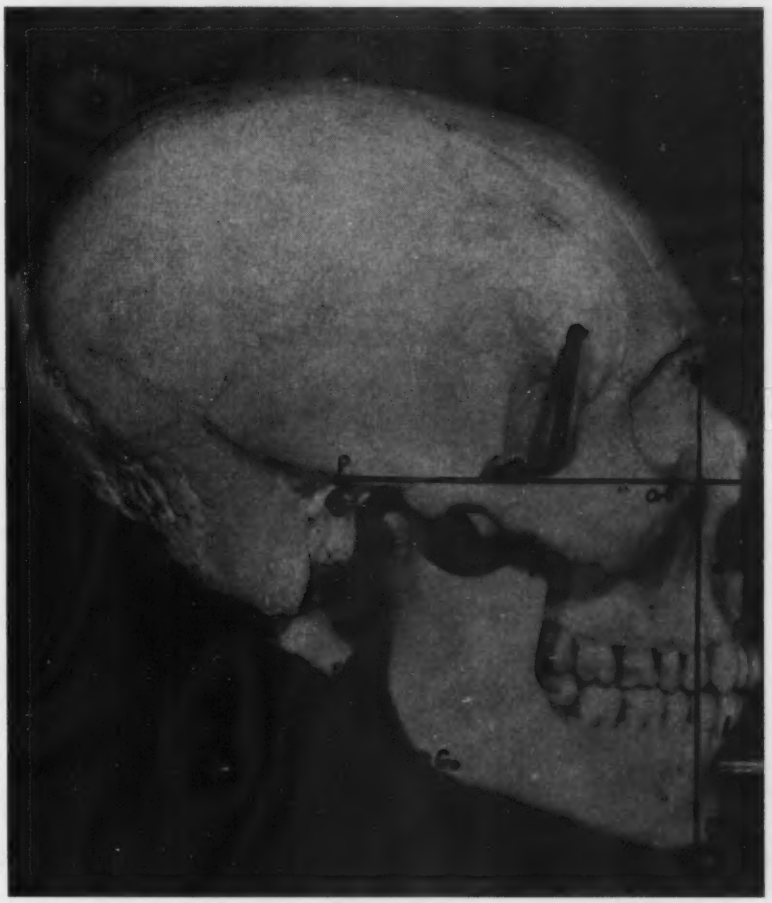


Fig. 1.—Profile view of skull showing planes of reference and anatomic landmarks used to study anteroposterior balance of vertical facial parts.

Observations concerning dentofacial balance are made also from the front and inferior views of the skull to study the extent of balance. In Fig. 2, planes of reference have been superimposed over the anterior surface of the skull to aid in studying lateral and vertical skeletal relationships. The vertical plane is

the *midsagittal plane*. By definition, it passes through nasion and the anterior nasal spine. This skull is so symmetrical that the midsagittal plane also passes through superior prosthion, inferior prosthion, and menton. In addition, the malar processes, the gonial angles, and similar lateral landmarks are symmetrically related to the midsagittal plane. As every orthodontist knows, all of the skeletal and dental landmarks are variable. They do not always exhibit the symmetry seen in this skull.

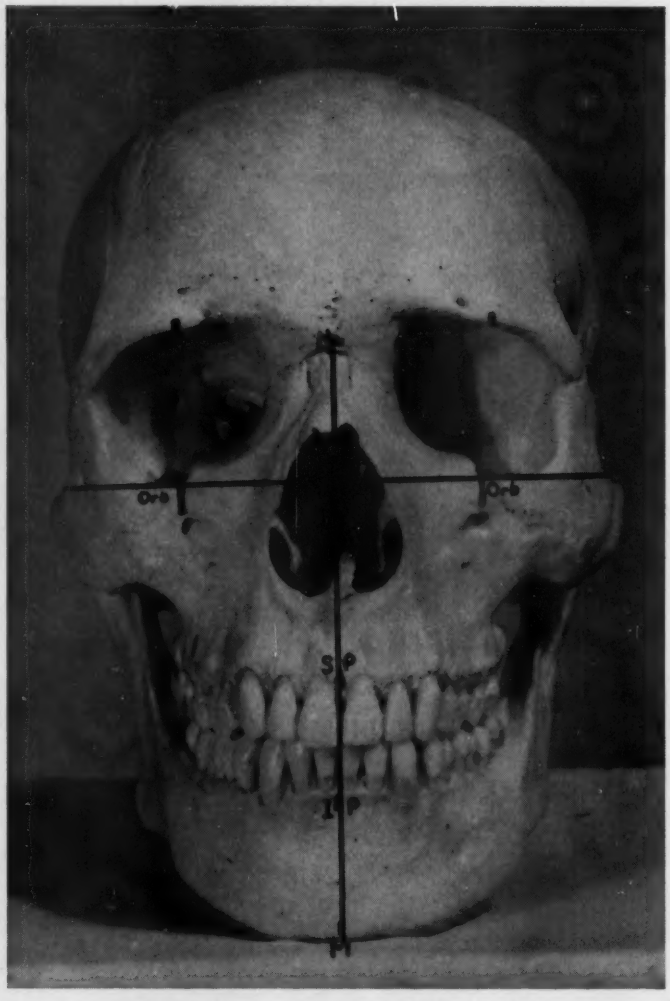
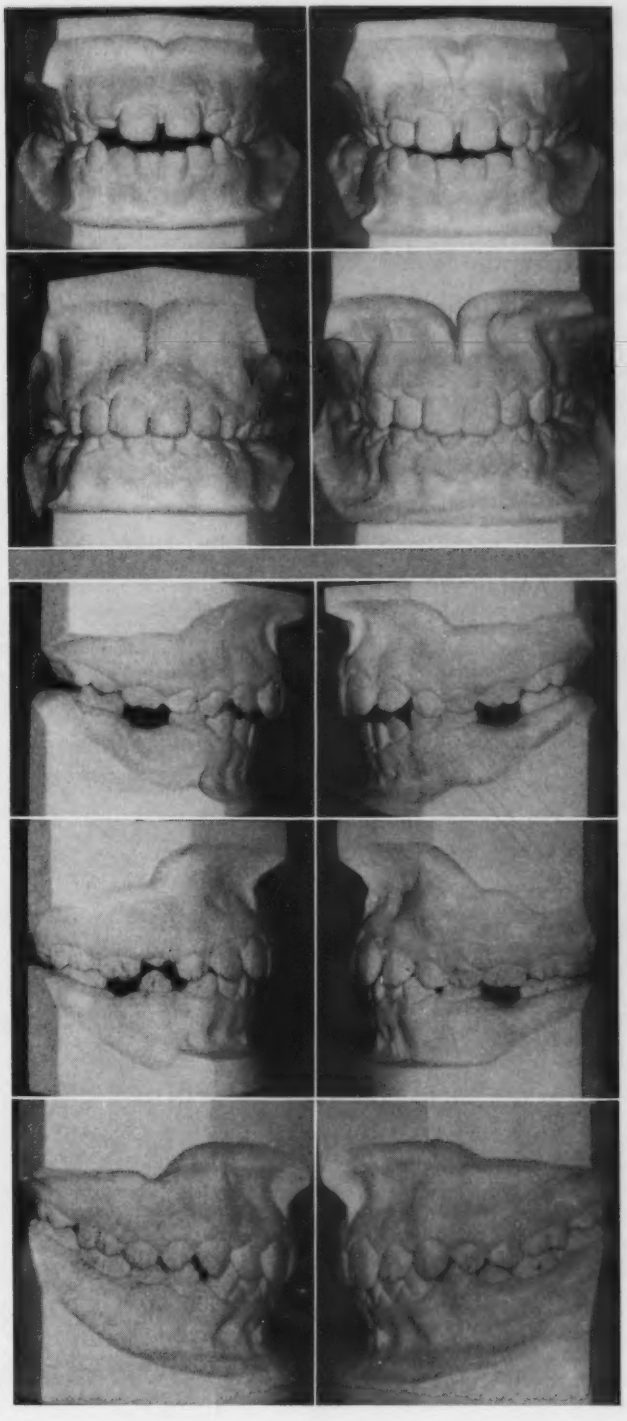


Fig. 2.—Front view of skull showing planes of reference and anatomic landmarks used to study lateral and vertical balance of facial parts.

The horizontal plane shown in Fig. 2 is called the *orbital plane*. In the facial form analysis it passes through right orbitale and is perpendicular to the midsagittal plane. In many persons one side of the face is more superior than the other side. The orbital plane is used to study these vertical variations. Again, however, this skull is so symmetrical that the orbital plane passes through both right and left orbitale.

A.



B.

Fig. 3.—*A*, Casts of dentition in balanced dentofacial structures where control of oral habit permitted satisfactory development of growing dentition.

B, Side views of casts shown in *A*. Occlusal contacts maintain lower second premolar space and permit satisfactory occlusal development in balanced dentition.

Excellent dental balance is found also in this skull. The number and size of teeth are in exact proportion to the supporting apical bases. The occlusion reflects the ideal balance between and within the supporting bones of the face. Removal of the fine layer of wax between the occlusal surfaces of the teeth in this skull would result in a perfect articulation of teeth. If, in addition, we could drape the mimetic muscles and the muscles of mastication over the facial bones and put the entire dentofacial system into action, balance of muscle function could be studied and evaluated.

Many other observations can be made directly and indirectly to study the extent of dentofacial balance. These observations are important in developing an orthodontic diagnosis. They should be made as precisely as possible. The use of a system or method of observation permits a more effective evaluation of the treatment opportunities and limitations in each patient. As I am beginning to realize, years of clinical experience do not take the place of accurate observation.

The brief description of dentofacial balance which I have presented is similar to others in our literature. Most of you carry a similar concept in your minds. It is an important concept in the consideration of early treatment and interception of malocclusion. When balanced dentofacial relationships are present, early treatment and interception of malocclusion are most effective. Here, the control of local etiological factors is sufficient to permit the growing dentition to develop a satisfactory occlusion. For example, Fig. 3,*A* shows the casts of a developing dentition complicated by two types of influence which disturb dental growth in balanced dentofacial structures. The cast on the upper left shows the results of one of these influences, an oral habit. This patient placed three fingers between her teeth, and the habit activity prevented the eruption of the maxillary and mandibular incisors. Here, interception consisted of a serious discussion about "what habits do to little girls' teeth." Casts and photographs were used to illustrate the discussion. The therapy was effective. The patient promised to stop putting her fingers between her teeth. The upper right hand and lower casts show the results. The cast on the upper left was taken when the girl was 7 years of age. The one on the lower right was taken when she was 12. No appliances were used.

The side views of this patient's dentition are shown in Fig. 3,*B*. Posterior dental development was complicated by the premature loss of lower second primary molars. The space was measured and observed from 7 to 12 years of age. Three sets of casts show the transition to the permanent dentition. No treatment or space management was indicated. Nature placed her own space maintainer. Close observation reveals that the maxillary second deciduous molars extruded to contact the mesial margin of the mandibular first permanent molars. The contact and force of occlusion were sufficient to maintain occlusal balance.

Fig. 4 shows the casts of a patient with the other two types of problem requiring early management and interception in balanced dentofacial structures. Here the interference to dental growth and development comes from a dental

anomaly and a cross-bite. The upper cast and the roentgenograms (Fig. 4) reveal a supernumerary right lateral incisor in the central incisor position and a supernumerary central incisor labial to the left lateral incisor. All incisors are well formed.

The first step in treatment was to remove the supernumerary teeth. The result is shown in the middle cast and roentgenogram. The right supernumerary lateral incisor and the left supernumerary central incisor were extracted. Some orthodontists may disagree with this decision. The right supernumerary lateral incisor was in good position for a crown. Also, the maxillary left lateral incisor is growing lingual to the teeth in the dental arch. In my opinion, however, the chances for optimum dental development are great in a case of this type. There is adequate room for all permanent teeth. There are no skeletal disharmonies to reduce the ability of the teeth to move into satisfactory occlusion.

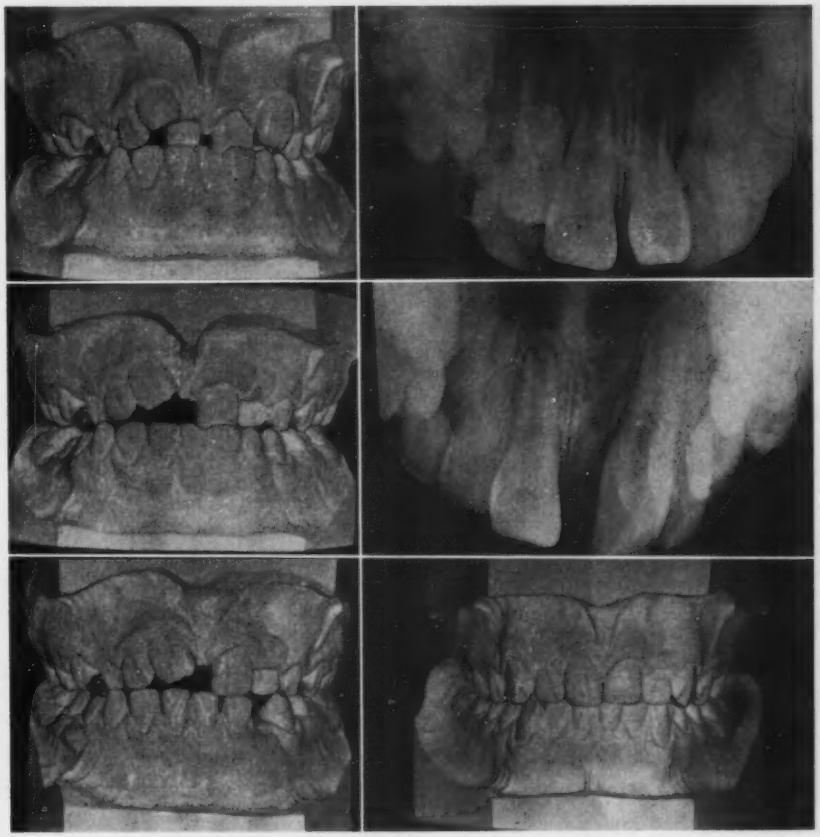


Fig. 4.—Casts and roentgenograms of supernumery teeth of dentition in balanced dentofacial structures. Extraction of supernumerary teeth and correction of incisor cross-bite permitted satisfactory occlusal development.

The casts reflect balanced dentofacial structures. Dental adaptation and adjustment through growth and development are at a maximum. I expected the right central incisor to erupt into its correct position and the left lateral incisor to move labially. The lower casts in Fig. 4 reveal the results. A tongue blade

was used by the patient to "jump" the left incisor into a very shallow overbite. The cast on the lower left shows the treatment result. The cast on the lower right shows the final result three years later. In this case, early treatment and interception consisted of judicious extraction of supernumerary teeth and ten days of tongue blade therapy to correct an incisor cross-bite. An excellent result was possible, since there was balance in and between the various parts of the dentofacial complex.

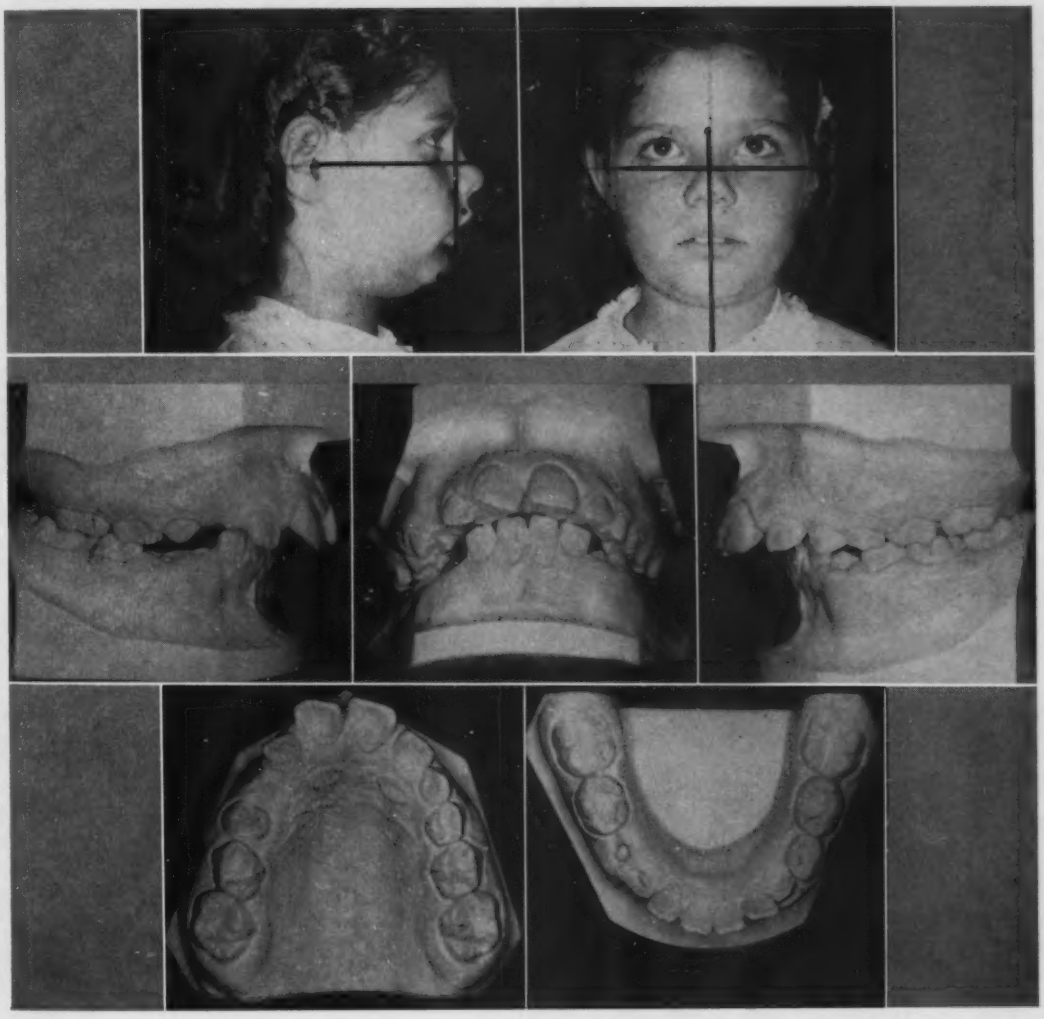
The two cases just reviewed illustrate the four major problems occurring in balanced dentofacial structures which require early treatment and interception: (1) the problems of space management, (2) the problems resulting from oral habits, (3) the problems associated with dental anomalies, and (4) the functional shifts of the mandible resulting from occlusal interferences.

Having briefly considered the nature of early treatment in balanced dentofacial structures, let us now study the interceptive needs in the unbalanced dentitions. Relative to the unbalanced dentitions, I want to recognize that the influences which act to modify balanced dentitions also act to modify unbalanced dentitions. For this reason, the above-listed problems must be controlled in all cases, irrespective of the extent of dentofacial balance. The fact that must be remembered about unbalanced cases is that early treatment is applied to reduce the intensity of the malocclusion. In addition, there are other problems.

To study the value of early treatment and interception in unbalanced dentofacial structure, let us examine the orthodontic problem of the girl shown in Fig. 5. Fig. 5,*A* shows the profile and front view of the patient's face. Planes of reference have been placed on the photographs to aid in showing the extent of dentofacial imbalance. The profile view reveals a posterior displacement of the mandible relative to the maxilla. This relationship is studied by relating the midfacial point and chinpoint landmarks to the nasion perpendicular plane. Midfacial point, at the ala of the nose, is slightly posterior to the nasion perpendicular plane. Chinpoint, or menton, is posterior to the nasion perpendicular plane by more than twice the amount of midfacial point. Chinpoint and midfacial points mark the anterior border of the maxillary and mandibular apical bases. The variation in the anteroposterior relationship of midfacial point and chinpoint serves to identify the lack of anteroposterior apical base bone balance. By this, I mean that the apical base of the mandible sits more posterior than the apical base of the maxilla. In addition, other observations about the anteroposterior balance of the dentoalveolar structures are of interest. Palpation of the maxillary and mandibular alveolar points at superior and inferior prosthion reveals considerable anteroposterior discrepancy in these parts. Here the variation is greater than that previously observed in the Negro skull. In part, this variation reflects the discrepancies observed in the apical base bone. Also, it reflects a lack of balanced facial muscular activity. When this girl swallows, she sucks the lower lip hard against the lower anterior and premolar teeth. In addition, the lower lip exerts force against the lingual aspect of the upper incisors. The upper incisors protrude. As we all know, a patient with a small retruded mandible has difficulty in establishing proper lip function.

In addition to the observations concerning mandibular displacement and lip function, other considerations relative to the profile view of this patient are of interest. The over-all size of the maxilla is greater than the over-all size of the mandible. The gonial angles range from medium to large. The mandibular bodies are nearly twice as long as the rami. While the maxillary incisors are prominent, they are not as protrusive as we might assume at first glance. Much

A.



B.

Fig. 5.—*A*, Front and profile views of patient with unbalanced dentofacial form. Planes of reference aid in studying nature of imbalance.
B, Casts showing occlusion of patient in *A*.

of their prominence and the large overjet results from a more anterior position of the upper apical base relative to the lower apical base. These observations concerning size and angular relationships serve to support the observations relative to mandibular displacement.

The front facial view also reveals interesting information about this patient. The midsagittal and orbital planes have been placed on the photographs. The malar prominences and gonial angles are an equal distance from the midsagittal plane. Chinpoint falls directly on the midsagittal plane. The incisor midline is slightly to the patient's left. Also, the left eye and orbital point are slightly more superior than the right eye. The left ear and ear hole are slightly more superior than those on the right side. The right ear is more posterior than the left ear. This is an important fact to consider when we use a head positioner for cephalometric roentgenograms. A vertical and posterior asymmetry of one ear forces the patient to turn his head when he places the ear posts in the ear hole. Recognition of this variation aids in the interpretation of the resulting cephalogram. It does not detract from the value of the roentgenogram as an aid in diagnosis.

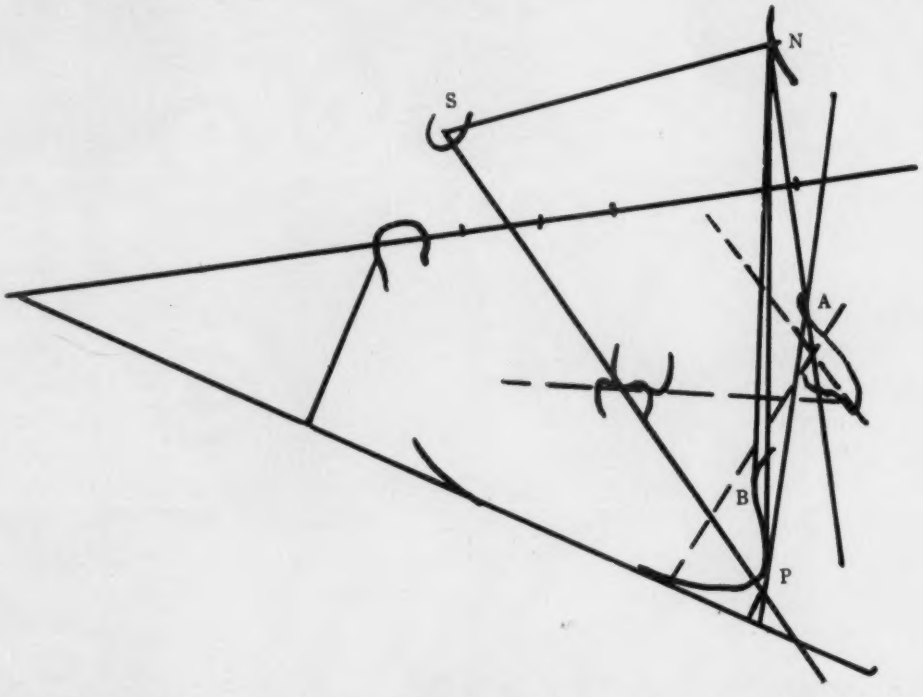


Fig. 6.—Patient B. B., aged 8½ years. Tracings taken from oriented lateral headfilms of patient shown in Fig. 5,A.

Casts of this girl are shown in Fig. 5,*B*. The girl has an Angle Class II, Division 1 malocclusion in the mixed dentition. She is 8 years 6 months of age. The upper teeth protrude, the right central and lateral incisors are rotated, the incisors are large teeth, and the lower incisors incline forward. A mixed dentition analysis reveals that there is inadequate room for the premolar and canine teeth if the incisors are to be retruded, uprighted, and placed in occlusion. In addition, there is a deep and impinging overbite. The lower incisors strike against the palate 4 mm. lingual to the maxillary incisors.

Tracings taken from oriented lateral head films of this patient are shown in Fig. 6. The planes of reference previously described can be used to study

and confirm some of the direct facial observations that we have made. In addition, a number of observations are made regarding the tracings to study the way the bones of the face go together to support the dentition. Here again our objective is to determine the extent of balance in and between the structural parts of the dentofacial complex. Some of the observations which I use are shown in Table I. They confirm the direct observations made with the facial

TABLE I. CEPHALOMETRIC OBSERVATIONS AND MEASUREMENTS IN PATIENT B. B., AGED 8 YEARS 6 MONTHS

MEASUREMENT	PATIENT	DESCRIPTION	AVERAGE
SNA	82°	Good	81°
SNB	72°	Poor	78°
Difference	10°	Large	3.5°
Facial ∠ (SNP)	82°	Tends small	87°
FMPL	32°	Large	21°
∠ of convexity	16°	Very large	0°
$\overline{1}$ to Mandibular plane	9.5°	Tends large	7°
1 to $\overline{1}$	110°	Small	135°
$\overline{1}$ to FM plane	17 mm.	Very large	5 mm.

MAXILLARY TO MANDIBULAR LENGTH (WYLIE)

MEASUREMENT	PATIENT	STANDARDS
Glenoid to sella	17	17
Sella to PTM	15	17
Maxillary length	50	52
PTM — 6	14	16
Maxillary length	96	101
Mandibular length	91	101

form analysis. The measurements about the SNA-B angles, the facial angle, the Frankfort-mandibular plane angle, and the angle of convexity all indicate a posteriorly displaced mandible. The Wylie analysis of anteroposterior dysplasia reveals that the mandible is shorter than the maxilla. The angular measurements about the relationship of teeth to supporting bone serve to confirm the lack of skeletal balance. The mandibular incisor plane angle and the upper incisor to lower incisor angle reveal that these teeth tip forward off the apical base. In addition, there is an excessive overjet.

From the foregoing observations, a number of conclusions can be made with respect to the extent of dentofacial balance in this patient. Both the direct facial observations and the indirect cephalometric appraisals indicate a lack of skeletal bone balance. The mandible is small and displaced posterior to the maxilla. There is some facial skeleton asymmetry. Also, the dental balance is unsatisfactory. If the incisors are to be retruded and a more functional occlusion is required, there is an excessive amount of tooth structure. In addition, this patient lacks muscular or functional balance. During swallowing the lower lip activity is abnormal. Its action protrudes the maxillary incisors and constricts the dental arches. The upper lip is flaccid. It does not assist the upper incisor position. The freeway space is excessive. Although not shown here, the freeway space was measured on a lateral cephalometric roentgenogram with the mandible at rest. It ranged from 4.5 to 6 mm. The patient exhibits an overclosure of the

mandible which results in a reduced vertical dimension. This girl, then, has a malocclusion typical of many that we see. She exhibits a lack of balance in all three structural areas of the dentofacial complex.

The opportunities for early treatment and interception to aid in directing growth for the dentitions shown in Figs. 5 and 6 are far different than in the balanced cases discussed previously. The lack of dentofacial balance limits the extent to which treatment is of value in directing the development of occlusion at this age. Nevertheless, the fact that the dentition is still developing is not sufficient reason to say that no treatment is indicated at this time. Certain dentofacial relationships can be changed to benefit the general pattern of growth. For example, we can retrude the maxillary incisors and establish better lip function. Also, we can upright the lower incisors and create a better relationship between these teeth and their supporting bone. These changes should be made as early as possible. On the other hand, other aspects of this malocclusion cannot be corrected completely at this time. Still, they require orthodontic management and control. For example, let us consider the problem of the overbite in this case. The patient has a deep impinging overbite, which results from a size difference between the maxilla and the mandible. The mandible is small and is displaced posterior to the maxilla. The deep impinging overbite is a hazard which requires particular consideration. Since this relationship and its significance have not received extensive consideration in our literature, I should like to consider it further at this time.

In 1942 Barrow and White[2] studied developmental occlusal changes in growing children. Their data consisted of serial longitudinal casts taken of children at the University of Michigan Elementary School Growth Research Center. These studies are coordinated by Dr. Byron O. Hughes. Barrow and White studied records of fifty-one children. The records of each child began when he was 5 years of age and continued yearly through the age of 19 years. With regard to overbite, three types of incisal contact were noted. The variations of incisor occlusal contact are shown in Fig. 7. Type A demonstrates the incisor contact found in balanced occlusions. Here the lower incisors contact the lingual aspect of the upper incisors. In cases with type A incisor contact the occlusal developmental pattern was always the same. The research revealed that the depth of overbite is reduced slightly at the time the lower deciduous incisors are lost. Following eruption of permanent incisors, however, the overbite stabilizes and stays the same through the age of 19. Type C shows a different set of incisal relationships. Here the lower incisor strikes the mucosa over the cingulum of the erupting upper incisor. Barrow and White called this type of incisor contact a "false" impinging overbite. They said that it was found in children at 7, 8, and 9 years of age with slowly growing dentitions. Following complete incisor eruption, the child has a *deep* but not impinging overbite.

In type B the development is different. Here the lower incisors strike the palatal mucosa completely lingual to the upper incisors. The previous casts exhibited this relationship. It is a deep impinging overbite. The research

revealed that in all cases in which there was a deep impinging overbite, the overbite increased continually from 5 to 19 years of age. In all probability, the depth of bite continues to increase in adults over 19 years of age who have this relationship. All of us have observed and treated adult patients with extreme deep impinging overbites. We manage them with varying degrees of success. In most cases, it is much easier to intercept and control this problem than to correct it.

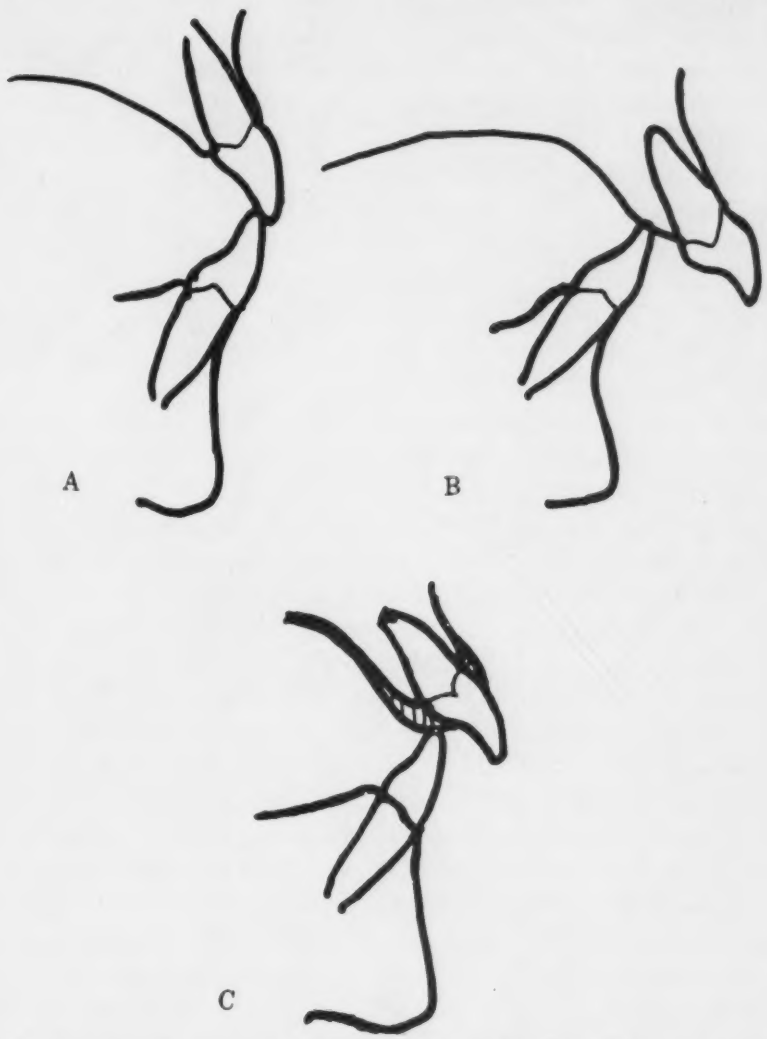


Fig. 7.—Outlines demonstrating various types of overbite and incisal occlusal contact.

In the girl previously discussed, control of the overbite problem alone constitutes a real service. If, in addition, we can establish reasonable lip and dental balance to permit the best possible occlusal development until the remaining permanent teeth erupt, a real service is rendered. In the unbalanced dentitions we may not always effect ideal occlusion. Still, we have worked to reduce the intensity of the malocclusion. Also, we have helped a child who needs our service far more than most patients who possess balanced dentofacial relationships.

So far in this discussion I have pointed out opportunities and limitations of early treatment and interception in the balanced and unbalanced dentofacial relationships. As every experienced orthodontist knows, however, there is another aspect of dentofacial balance with which we deal. From the clinical point of view, we can define a borderline or intermediate type of balance. If we were dealing only with physical relationships in structure and form, the borderline category would not be possible. Instead, however, we deal with vital biologic structures. These structures—the jaws, the teeth, and the muscles—have the ability to adjust and adapt to the environment which surrounds them. The dentition does this most easily during its early stages of growth and development. During this time appropriate amounts of treatment and growth guidance permit the maximum in dentofacial development. In this regard, the orthodontist has a particular responsibility. He is required to look ahead and anticipate the consequences of a given dental growth pattern as it proceeds to maturity. When indicated, he should apply orthodontic management to assist the development of the dentition to its maximum efficiency. In the dentofacial structures, with borderline balance, these efforts can be highly effective. To illustrate, let us study the problems of the patient shown in Figs. 8 and 9.

Fig. 8,*A* shows the facial and intraoral views of a girl aged 8 years 4 months. Appraisal of the lateral facial form has been made. The Frankfort and nasion perpendicular planes have been placed on the photograph. The midfacial point, maxillary alveolar point, mandibular alveolar point, and chinpoint are indicated. The midfacial point at the ala of the nose is slightly posterior to the vertical nasion plane. Chinpoint is less than half again more posterior to nasion perpendicular than the midfacial point. The anteroposterior difference between the midfacial point and chinpoint indicates only a slight posterior displacement of the mandible. You will note, also, that the anteroposterior discrepancy in this case, although present, is much less than the same difference in the previous patient. Other facts support this conclusion. The gonial angle tends to be large. The Frankfort-mandibular plane angle looks large. A lateral headfilm revealed that the Frankfort-mandibular plane angle is 30 degrees; 21 degrees is average. On the other hand, as you study the over-all size of the mandible in relation to the maxilla, there is no great size difference. A Wylie analysis reveals less than 2 mm. of difference in maxillary and mandibular length. Both jaws are longer than Wylie's standards. The angular measurements are also of interest. Both SNA and SNB angles are larger than average. Still, the SNA to B angle is 8 degrees. This is larger than the 3.5 degrees which most analyses use as the standard. The facial angle is 89 degrees, which is only 1 degree larger than the standard 87.8 degrees. In contrast, the angle of convexity is 15 degrees; Downs' average for this angle is 0 degrees. This girl, then, has facial characteristics typical of many patients. As you study her face and the many observations which can be made about it, one fact is clear: The observations are contradictory in nature. Some dentofacial relationships are balanced. Other relationships are unbalanced. This patient exhibits a borderline type of skeletal balance. The lack of true skeletal balance results from slight variations in the way the bones

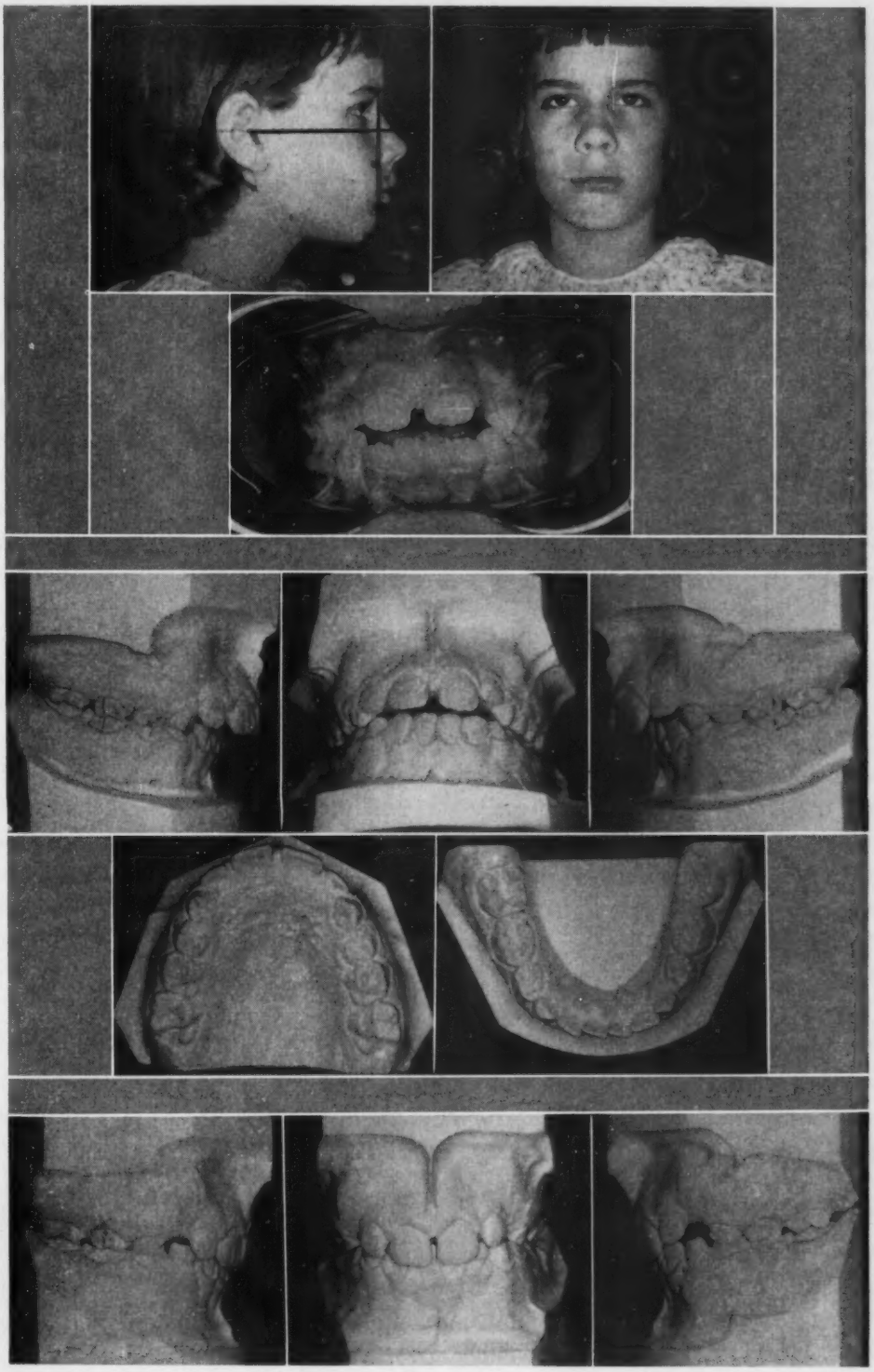


Fig. 8.—*A*, Facial and intraoral photographs of patient with a borderline type of dentofacial balance.

B, Casts showing occlusion of patient in *A*.

C, Casts showing incisor changes following five months of treatment.

of the face go together. There is no obvious size difference between the upper and lower jaws. However, the wide gonial angle throws the chinpoint slightly down and backward. Perhaps the maxilla is slightly larger than the mandible. Even so, both are large bones. They are capable of supporting the teeth within them. In addition, the front view shows good lateral facial balance. No facial asymmetry is evident. The open-bite is the result of an active lip and tongue habit. The patient presented complaining about the open-bite and slight upper incisor protrusion.

Before moving on to the casts and treatment plan, I want to stress one point about this face which supports the concept of borderline balance. As you study the lateral profile view, note the position of the maxillary alveolar and mandibular alveolar points. The maxillary alveolar point at superior prosthion is slightly anterior to the nasion perpendicular plane, and the mandibular alveolar point at inferior prosthion is slightly posterior to the nasion perpendicular plane. Here mandibular alveolar point is more anterior than chinpoint. In this case, the lower denture sits forward on its apical base. This is in contrast to the previous patient, in whom the mandibular alveolar point was slightly posterior to chinpoint and the lower denture sat more posterior upon its apical base. Here, again, the upper and lower dentoalveolar points reflect the anteroposterior balance as shown by the apical base points at midfacial point and chinpoint. Actually, they show a closer vertical balance than is seen in most patients.

Casts of this girl (Fig. 8,*B*) reflect the observable anteroposterior variations of apical base bone. There is an Angle Class II, Division 1 malocclusion. The maxillary incisors are slightly protrusive, and they are spaced. The lower incisors are slightly crowded and irregular. However, the dental arches are broad and trapezoidal in nature. The teeth are of medium large size. A mixed dentition analysis reveals an excess of 2 mm. in arch length for the lower premolars and canines. In contrast, the upper molar to lateral incisor spaces are slightly inadequate for the premolars and canines.

In this case, as in all cases, the treatment plan was conditioned by the nature of the problem. In terms of dentofacial balance, the prognosis was fair. There was a borderline type of skeletal balance. The dental balance was close but adequate in the lower arch. The upper dental arch was short. However, the large maxillary apical base indicated a reasonable prognosis for lengthening the upper dental arch. In addition, the closure pattern of the mandible was normal. Only the lip and tongue habit complicated occlusal development. The malocclusion was described as a dentoalveolar distoclusion. This description differs from the description used for the malocclusion of the girl in Fig. 5, who had a distoclusion resulting from a basal bone variation. It is described as a skeletal distoclusion. In view of current knowledge about the cause and control of malocclusion, it is more reasonable to institute early treatment and interception in the dentoalveolar distoclusion.

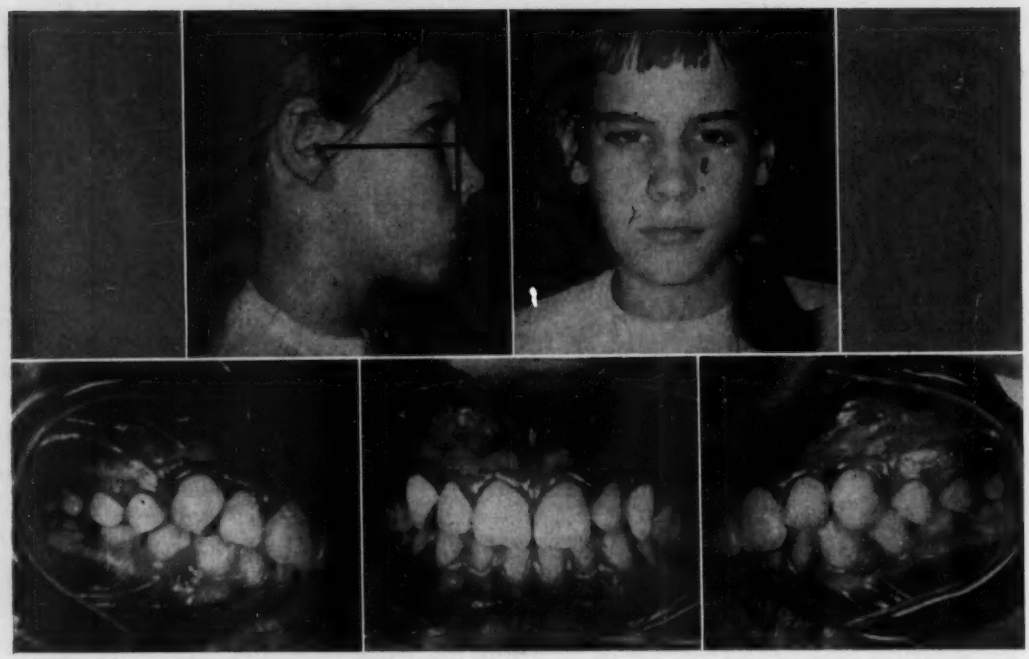
Before making a final decision about treatment, the hereditary background of the patient was examined. The father had an ideal occlusion in a large,

well-balanced face. The mother had a mutilated dentition with a vertical and posterior functional shift. Her molars occluded into a whole-cusp Angle Class II relationship. At rest, however, the mandible moved downward and forward. The molars opposed each other in an end-to-end relationship. The overjet was small. In addition, there was an excessive freeway space reducing the distoclusion. The mother had a midfacial prominence. Both jaws were large. Her teeth were larger than her daughter's. She had a borderline skeletal balance similar to her daughter's. From this information, it is evident that the family background provided some evidence of an inherited tendency toward dentofacial imbalance. However, it was not extensive. Neither parent exhibited obvious skeletal or dental discrepancies.

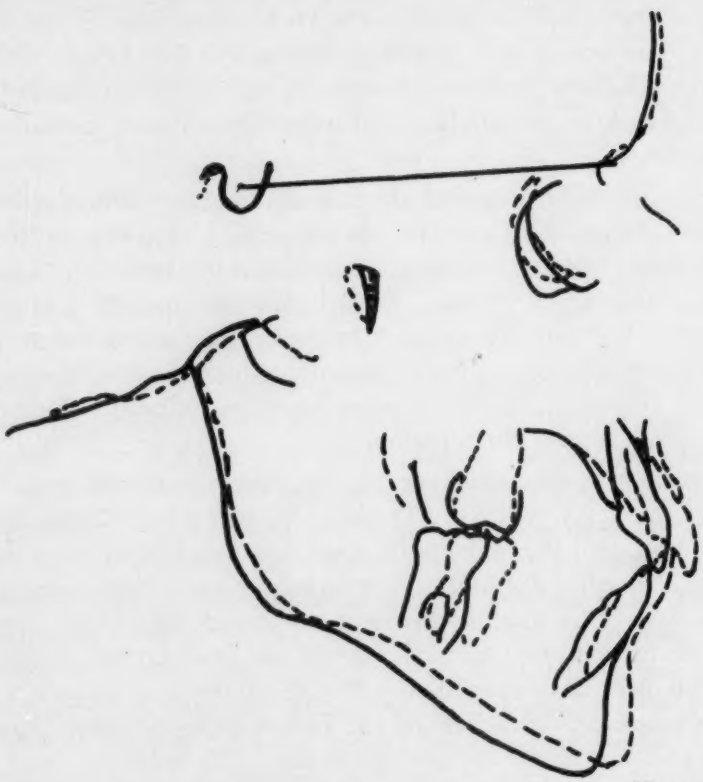
I have elaborated on the facts about the parents' dentitions to emphasize a point relative to our considerations concerning the extent of dentofacial balance. As we study orthodontic problems it is necessary to remember that, in addition to physical balance, there must be biologic balance. In this regard, it is unreasonable to think that developmental changes that occur during treatment are without cause. Many times they can be anticipated. One way is to study inherited possibilities in any patient. Everyone realizes that these possibilities are too complex and too numerous to be evaluated fully in clinical practice. Still, like weather reports, they can be used to give us ideas about the nature of the developmental atmosphere in which we work. In this case, the hereditary prognosis for early treatment and growth guidance was favorable. Other members of the family exhibited balanced occlusions under similar developmental and anatomic relationships. A similar evaluation should be a part of every orthodontic diagnosis.

In the girl shown in Fig. 8,*A* the initial treatment efforts were directed at controlling the abnormal lip activity. In addition, I wanted to retrude the upper incisors. An oral shield was selected to facilitate the treatment objectives. The patient was instructed in its use. Casts taken five months later show the result (Fig. 8,*C*). The patient was seen twice during the five-month period. The maxillary incisors contact the lower incisors, and the molars remain in Class II malocclusion. However, the distoclusion has been reduced. Although it is not shown here, there is good lip function.

The next step in treatment was to lengthen the dental arch. A headcap and extraoral traction were used. The headcap was attached to a labial wire and yoke combination, and the labial wire was fitted into buccal tubes on upper first molar bands. No other appliances were used. The patient wore the appliance for eight months. She was checked at three-month intervals. Fig. 9,*A* shows the face and dentition one year after use of the headcap was discontinued. No retentive appliances have been used. The facial form is similar to the before-treatment appearance. Relative to the nasion perpendicular plane, the midfacial point and the chinpoint are the same. The maxillary and mandibular alveolar points show a closer anteroposterior vertical balance than before treatment. The intraoral photographs reveal a reasonable occlusal balance. The right maxillary arch shows a little spacing. The lower incisors are mildly crowded; they are the same as before treatment. Cephalometric tracings taken before and



A.



B.

Fig. 9.—*A*, Photographs showing face and dentition one year after headcap was discontinued.

B, Cephalometric tracings illustrating dentofacial relationships before and after headcap treatment. Solid line represents condition on March 3, 1954; broken line represents condition on Sept. 9, 1956.

after use of the headcap are of interest also (Fig. 9,*B*). The solid line represents the before-treatment relationship and the dotted line shows the after-treatment relationship. The tracings have been oriented on sella and the sella to nasion plane. In this illustration it is evident that the chinpoint and the anterior border of the maxilla have moved forward. The posterior border of the ramus is forward. The orbits and frontal bone show slight upward and forward movement. In the jaws, the incisors have followed the maxillary and mandibular developmental changes. The lower molars are forward. In contrast, the upper molars stayed in the same position. Apparently, the occipital traction served to hold the upper molars in position while all other structures moved forward. The maxillary dental arch was lengthened. A neutroclusion resulted.

Several considerations are important in the case shown here. The dentition was adjusted from a distoclusion to a neutroclusion. No retention was required. These facts demonstrate the ability of the natural dentition to make permanent adjustments upon its apical base. These adjustments are reasonable and are expected in cases which exhibit a borderline dentofacial balance. They are made most easily when treatment is applied early in the developing dentition. On the other hand, when the dentitions with borderline balance are permitted to grow into permanent malocclusions, the treatment opportunities are far different. Then these problems may require the same treatment considerations as the deep-seated unbalanced cases. Also, the establishing of balanced occlusions is more difficult. Dental irregularity and protrusion are harder to handle. Permanent retention is often necessary. On the other hand, it is important to recognize that not all borderline dentitions must be treated in the manner shown here. In fact, the management of a borderline dentition is usually a compromise in treatment. For the most part, the borderline case cannot be perfectly balanced. Neither is it perfectly unbalanced. In the problem shown here, for example, it was necessary to accept minor crowding or go to excessive extraction. In any case, however, the final decision depends on the particular dental requirements of the patient.

In conclusion, I wish to review the points made in this article. At the beginning it was stated that one of the most important considerations relative to early treatment and the interception of malocclusion is the extent of balance in the dentofacial complex. In *balanced* dentofacial structures, early treatment and interception produce maximum results. Here the control of local factors permits the development of nearly ideal dentitions. In contrast, in the *unbalanced* dentofacial structures, the problem is much different. In these cases, it is usually impossible to direct the growing dentition into satisfactory occlusions. A lack of balance and harmony in and between the basic structural parts of the face prevents successful growth guidance. In spite of this, all unbalanced dentitions require a consideration of early treatment and interception. An effort is made to determine the area and extent of imbalance. Treatment is applied to limit abnormal dentofacial growth. We do this to reduce the intensity of the malocclusion and make it more adaptable when the time for final treatment arrives. Finally, in the malocclusions exhibiting a *borderline* type of

dentofacial balance, we apply early treatment and interception in the form of growth guidance. We work to direct the developing dentition into reasonable and stable occlusions.

REFERENCES

1. Angle, E. H.: Treatment of Malocclusion of the Teeth and Fractures of the Maxillae, ed. 6, Philadelphia, 1900, S. S. White Dental Mfg. Co.
2. Barrow, G. V., and White, J. R.: Developmental Changes of Maxillary and Mandibular Dental Arches, Angle Orthodontist **22**: 41-46, 1952.
3. Downs, W. B.: Variations in Facial Relationships: Their Significance in Treatment and Prognosis, AM. J. ORTHODONTICS **34**: 812-840, 1948.
4. Moore, G. R., and Hughes, B. O.: Familial Factors in Diagnosis, Treatment and Prognosis of Dentofacial Disturbances, AM. J. ORTHODONTICS & ORAL SURG. **28**: 603-639, 1942.
5. Thompson, J. R.: The Rest Position of the Mandible and Its Significance to Dental Science, J. Am. Dent. A. **33**: 151-180, 1946.
6. Wylie, W. L.: The Assessment of Anteroposterior Dysplasia, Angle Orthodontist **17**: 97-109, 1947.

THE STATE OF YOUR ESTATE

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IT IS a pleasure to discuss with you a subject which must be of great concern to you and your family, namely, the "State of Your Estate." The subject is a complex one, and I shall have to convey some rather dull legal information if I am to be at all helpful to you.

We shall put the cart before the horse to some extent and deal first with the question of disposing of your estate, and then we shall consider ways in which you can build up your estate during your lifetime.

ESTATE TAX DEDUCTIONS AND EXEMPTIONS

You are undoubtedly concerned about the Federal estate tax and its provisions. There is an exemption of $60,000.00 in the estate tax. Thus, if your net taxable estate is $60,000.00, you will pay no tax. Then there is the marital deduction which gives you a deduction of everything you leave to your wife or everything that she gets as a result of your death up to one-half of your adjusted gross estate. Thus, if your adjusted gross estate is $120,000.00 one-half of that, or $60,000.00, is a marital deduction. That leaves $60,000.00, but you have an exemption of $60,000.00, which leaves a taxable estate of zero.

In other words, if you are married and your estate after funeral and administrative expenses comes to no more than $120,000.00, you will have to pay no tax. Please note that life insurance is included in this total and is not given any special treatment. There used to be a deduction for life insurance, which many people still remember, but that is no longer in existence. The life insurance under which you control the beneficiary becomes part of your estate for estate tax purposes, even though it passes to the beneficiary without any mention of it in your will. Charitable bequests are also deductions. Please note that there is no limit on the amount of charitable bequests that can be deducted for estate tax purposes. This is different from the case of the income tax where there is a limit which is tied to your income.

GIFT TAX DEDUCTIONS AND EXEMPTIONS

It is important for you to realize that there exists a gift tax. The rates are three-quarters of the rates of the estate tax. In other words, you cannot avoid completely the estate tax by giving away an unlimited amount of property

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during life. However, there are substantial deductions and exemptions. You can give to each of any number of persons in every year the sum of $3,000.00 which is totally exempt from the gift tax. If your wife joins by giving her formal consent, you can give to any child the sum of $6,000.00 every year exempt from the gift tax. One-half of anything and everything that you give to your wife is exempt from the gift tax, no matter how much it is. Moreover, in addition to all of these deductions and exemptions you have a lifetime exemption of $30,000.00 which you can give to whomever you please or whenever you please. This is over and above the $3,000.00 and $6,000.00 figures mentioned a moment ago and also over and above the deductible portion of the gift that you give to your wife. For instance, if you give your child $3,000.00 in a year, that is exempt. If you give your child $6,000.00 in a year with your wife's consent, that is exempt. If you give your wife $10,000.00 in a year, $5,000.00 is exempt. That leaves $5,000.00, but there is a $3,000.00 deduction and you have a $30,000.00 total exemption for your lifetime so that you can draw down that total by $2,000.00 to $28,000.00 to be used at some other time. Thus, all the gifts that have been mentioned will involve no tax whatever.

A special problem arises when gifts are made within three years of death. There is a possibility that these will be declared to be gifts made in contemplation of death. They will then be taxed at the full estate tax rate instead of being subject to the gift tax rates (if they are not otherwise exempt or subject to deduction), which are, as pointed out earlier, three-quarters of the estate tax rates.

MARITAL DEDUCTION

One of the important devices in reducing estate taxes is the marital deduction to which I referred a moment ago. The full amount left to the wife up to one-half of the adjusted gross estate is deductible from the estate for tax purposes. It must be remembered that the taxable estate is usually greater than the estate that passes through the will (the probate estate). For instance, as pointed out previously, insurance usually passes to the wife outside the will. It will ordinarily be included in the taxable estate for Federal estate tax purposes unless the insured has given up all incidents of ownership including the right to change the beneficiary.

Similarly, a joint account or jointly owned property will pass to the wife outside the will but will be included in the taxable estate if the deceased actually provided the funds. Also, gifts that are found to have been made in contemplation of death will be included in the taxable estate, although of course they do not appear in the will or the probate estate. (There is now a conclusive presumption that gifts made more than three years before death are not made in contemplation of death.) It is important to remember these points to assure the maximum deduction. The marital deduction is up to one-half the adjusted gross estate for estate tax purposes, not merely the probate estate which passes by will.

This does not mean, however, that it is always wise to take the maximum marital deduction; it is not always wise to reduce the estate tax from the husband's estate as much as possible. The estate tax is progressive, ranging from 3 per cent on the first $5,000.00 of taxable estate to 77 per cent on amounts over $10,000,000.00. To the extent that we reduced the husband's estate tax through the use of the marital deduction, we add potentially to the wife's estate and hence her estate tax. If the wife has separate property in large amount, it may be a mistake to augment her estate by the full marital deduction. This might put her estate into a much higher tax bracket than her husband's. The result of this would be that the total tax on the two estates would be greater than if the husband had transferred less property to his wife, even if that meant that he took less than the maximum marital deduction and paid a higher tax than necessary. The total tax on the two estates would be minimized by equalizing the two estates.

It is difficult, of course, to calculate the right amount of marital deduction for this purpose, because we can never be sure how much of her property the wife will have on her death. Whether or not she remarries is, of course, an important factor in this regard. We cannot make any estimate on the probabilities of this without a great deal of detailed information covering the particular case.

RELATIONSHIP BETWEEN LIFE INSURANCE AND YOUR WILL

Life insurance that names a particular person as a beneficiary will pass to that person outside the will, that is, it will pass to that person automatically. Your desire that it pass to the named beneficiary need not be mentioned in the will and, in fact, its mention would not have any effect if the policy itself specifies that person as the beneficiary. This is one illustration of the fact that you must take account of your entire estate and not just your probate estate, that is, the estate that passes through the will.

Nevertheless, there are some respects in which it is necessary or desirable to make reference in the will to the life insurance, even though the life insurance will pass to the beneficiary outside the will. The estate will be subject to estate taxes on the total estate, that is, on everything that passes to anyone because of your death, whether or not the will is involved. The Federal Government is going to collect its tax, no matter what. It can collect it from anyone and everyone who benefits from the estate. Thus, the life insurance that you leave may be made to bear its proportionate share of the estate tax. This means that the beneficiary of the insurance policy might find that what he or she gets is reduced; this may completely upset the plan that you have for protecting your beneficiary, and it may also upset any of the settlement options, such as income, which he or she is to take on your death.

It is possible to avoid this result by specifying in the will that all settlement expense, including taxes, must be borne by the general estate and that none of it should come out of the insurance policies. This assumes, of course, that there is enough in the general estate to take care of the taxes.

SHOULD YOU CARRY LIFE INSURANCE ON YOUR WIFE?

A question that frequently is asked is: "Should I carry life insurance on my wife?" Most men, particularly hard-working professional men like yourselves, assume that their wives will outlive them. In fact, this is true, on the average, but that does not mean that it will be true in your particular case.

There are a number of good reasons why a husband should own insurance on the life of his wife, even though he himself is adequately covered.

Providing Cash to Cover Settlement Costs.—If your wife has a lot of property in her name, then there may be an inheritance or estate tax liability on her death. The insurance will provide liquid funds with which to cover these taxes. There may also be heavy expenses connected with a last prolonged illness and burial expenses incident to the death.

Covering Household Expenses.—After the loss of the household manager, any family must suffer increased expenses. If nothing else, there is the expense of hiring a capable housekeeper to take care of the children. This can involve a substantial drain on the annual budget and may best be capitalized, that is, taken care of out of a capital fund through an insurance policy on the life of the wife.

Covering Increased Income Taxes.—An important factor that is often ignored is that the husband will incur higher income taxes after the death of his wife. Within two years after her death the husband loses the right to file a joint return, so that he loses the advantage of split income. The loss is greatest if he has to file as a single person, but it is substantial even if he can file as the head of a household. In any case, the full advantage of split income is lost to him.

There are two other losses with respect to income tax. The husband loses the wife's personal exemption, and the maximum medical expense deduction —not the regular expense deduction—would be reduced by the loss of the wife.

Increased Estate Taxes in the Husband's Estate.—An important matter that is often ignored is the fact that the wife's prior death will reduce the husband's net estate. The reason for this reduction in net estate is that the husband's estate taxes will rise, since he will lose the marital deduction as a result of the wife's prior death. If the husband is married at the time of death, then there is a deduction against his estate of everything that goes to his wife up to one-half of his adjusted gross estate. For instance, if his adjusted gross estate is $200,000.00, then there is a deduction of $100,000.00 if he has given his wife at least that amount. If he dies, however, after his wife has predeceased him, this deduction can no longer be taken. This means that the taxes that would have to be paid out of his estate will be substantially greater if his wife dies before he does than if his wife is still living at the time of his death. For this reason, it is important that there be some increased capital accruing to the husband, and therefore presumably to his estate, so that the children will receive as much protection after his death as they would if his wife were still alive and he was able to take the marital deduction, thereby leaving the net estate larger.

TRUST

There are many reasons why you may wish to leave the bulk of your estate in the form of a trust. You may set up a trust so that your wife receives the income during her life and the capital is preserved for your children without going through her estate. In that way only one estate tax is paid on the capital instead of two estate taxes, namely, the tax on your estate and then another tax on your wife's estate if you give the property entirely to her and then leave it to her to pass on to the children. It is possible to set up a trust which qualifies for the marital deduction and at the same time keeps control of the capital out of the wife's hands. This is called a marital-deduction trust. It is also possible to give her merely the power to decide who should receive the capital, thereby making it possible for her to protect the capital from any creditors that she may have.

The trust with corpus to the children does not qualify for the marital deduction. You pay the tax, but your wife does not. Where the trust qualifies for the marital deduction you do not pay the tax, but your wife does. Therefore, the choice between the two will depend, first of all, on whether you wish to control completely where the corpus goes and, second, on whether you wish the tax to be paid out of your estate or out of your wife's. The latter involves some estimate of relative life expectancy and also the relative size of the two estates.

Trusts With Power of Appointment.—There is one kind of trust that scares off the clients and sometimes even their lawyers because it sounds complicated. Actually, it is not really complicated at all. This is a trust with a power of appointment. The "power of appointment" merely refers to the power to designate who shall receive the capital after the death of the person who is to make the designation. For instance, if you give your wife the power of appointment, that means that she will have the power to decide who gets the capital from the trust after she dies. If you set up a trust which gives your wife the income for life and also gives her unrestricted power to designate who shall receive the capital of the trust, that is, the corpus of the trust, after her death, you have set up a trust with power of appointment.

Now this kind of trust has a number of advantages. For one thing, it qualifies for the marital deduction. For instance, if you leave $100,000.00 in trust for your wife and give her the power of appointment on her death, the $100,000.00 will be deductible from your estate as long as it qualifies otnerwise, that is, as long as it does not raise the total that you give your wife to more than one-half of your adjusted gross estate. In this way you have all the advantages of a trust, and yet you make the saving on estate taxes in your own estate. Your wife gains the income from the $100,000.00 and she cannot touch the capital during her lifetime. (Of course, if you want her to have the right to use up the capital during her lifetime, that is all right with the Treasury Department. It does not disqualify the bequest from the marital deduction.) The major advantage of this type of trust is that it is immune to your wife's creditors. If the corpus merely goes to her estate and is distributed as her will

provides in the ordinary way, any creditors that she may have would have first claim to the capital over any of her beneficiaries. However, you are not putting the capital into your wife's estate; you are merely giving her the power to decide who shall receive the capital. Although this sum will be included in her estate, it will not be subject to the claims of her creditors.

Selecting the Trustees.—One question that must be settled by you is: "Who shall be the trustees, and how shall they be directed?" The trust provisions can express your wishes and guide the trustees along certain lines. It is unwise to impose absolute restrictions, for the circumstances five, ten, twenty, or more years from now may be such that you could not even begin to conceive of them. For instance, it may be unwise for you to prohibit your trustees from allowing the income to be used for pleasure trips to the moon. It is wise to have a trusted friend as a trustee but not as the sole trustee. It is desirable to ensure continuity of the trust management. For that reason, a corporate trustee, such as a bank, should be one of the trustees named.

GIFTS TO CHARITY

It may be that you would wish to make certain gifts to charity in your will —perhaps to your old alma mater or to a religious or other charitable institution. The tax law is set up in such a way that a number of advantages accrue as the result of a gift to charity. In the literal sense, it may appear that no one could possibly become richer by giving anything to charity because, after all, you are parting with, say, $10,000.00 and at best the tax saving would be only some fraction of this. In actual fact, however, there are certain advantages that may have the effect of leaving your wife and children better off than if you did not make the gift to charity. This may strike you as being an exaggeration, but perhaps a little explanation will make the point clear.

First of all, regarding the increase in the liquidity of the estate, property left to charity (including universities!) is deductible from the taxable estate even if a life interest is reserved for a beneficiary, such as a wife or children. (The amount of the deduction is based on actuarial computations.) This deduction reduces the amount of estate tax. The estate tax, of course, has to be paid in cash. The deduction, therefore, means that more cash is available without the sale of property. Sometimes it is very difficult or unwise to sell property even in a year or two after death in order to pay estate taxes. Thus, the preservation of cash by using the charitable deduction to reduce the tax and therefore the cash required to pay the tax can increase the amount of liquid resources, especially cash immediately available for the use of the wife and children. True, the total assets are reduced by the gifts to charity because, after all, the tax saving is only a percentage of what is given away. But what we have done is increase the amount of liquid assets by transferring to charity the stocks and bonds or other property that might not have a ready market, and we have increased the amount of cash and other liquid assets.

Since less property has to be sold to pay taxes, there is more property available (including the property that is ultimately to go to charity) to earn

income for the income beneficiary. For instance, if there were no gift to charity, the capital available to earn income for your wife might be, let us say, $100,000.00, but with an appropriate gift to charity the capital might be $120,000.00 instead. The charitable institution to which you leave the capital waits for its money until after the death of the income beneficiary.

Another major problem that is partially solved through a gift to charity is that of valuation of closely held stock. Most of you probably will not encounter this problem, but some of you may have stock in small closely held companies. For instance, you may have stock in a building in which you, together with other professional men, have your offices. Also, you have undoubtedly been approached by, and perhaps some of you have succumbed to the request of, your business friends to invest in this or that little corporation that is going to make a killing.

The difficulty is that the stock of such corporations does not have a ready market and it is not possible to look in the financial pages of the newspaper to decide how much it is worth. The tax commissioner must, however, put a value on that stock. Virtually unlimited difficulty can arise in deciding on that value. Even where there is a ready market for securities and a stock market quotation that can be used, there is a problem in deciding which stock market quotation to use. Generally, the procedure is to take the average of the high and the low on the day of death; alternatively, one can take the value one year after death. Complications are introduced by the problem of "blockage." The stock market quotation is not reliable when there is a large block of stock to be liquidated. In that case, the stock market quotation is generally regarded as being too high. Occasionally, however, the opposite is true; the controlling block of stock may get more than the stock market quotation which applies really to a small amount that is traded in the particular transaction.

The problems of valuation of closely held stock are well illustrated by a recent tax court case, *Estate of Cora Fitts v. Commissioner* [237 Fed. (2nd) (CA8, 1956)]. The facts (somewhat modified for purposes of this illustration) were that the taxpayer submitted a value of $150.00 per share, the commissioner used a value of $600.00, and four experts set values ranging from a low of $150.00 to a high of $225.00. The tax court, after saying that all the appraisers had some qualifications and that their testimony was not ignored, set a value of $375.00. This happens to be the average of $150.00 and $600.00. It also happens to be the sum of $150.00 and $225.00. If the latter is the basis of the figure of $375.00, there appears to be some danger in having too many appraisers—their valuations may simply be totaled by the tax court!

How can we guard against an excessive valuation of closely held stock by the tax commissioner? Suppose you have 100 shares of such stock. Now give fifty of those shares to charity and use the other fifty for some other bequests, such as to your wife, children, a trust fund, or what have you. If the commissioner sets an excessively high value on that stock you are protected. If he sets a high value you get a large deduction, for you have included some of

the stock in the charitable bequest which you are making. This gives you a hedge against an excessive valuation of the stock. If the valuation of the stock is raised, the charitable deduction is likewise raised; hence, the potential rise in the estate tax may be offset in part.

BUILDING AN ESTATE

You undoubtedly feel that the subject that has been discussed thus far, namely, how to dispose of your estate on your death, is a relatively minor one. The difficult question is how to build an estate. The first job, of course, is for you to earn more than you spend or spend less than you earn, whichever way you wish. That is a task on which I can give you neither guidance nor advice. I assume, however, that you are currently receiving the best possible advice on your income tax, giving unto Washington that which is Washington's and keeping unto yourself that which is rightfully yours.

Fixed- Versus Variable-Dollar Investments.—Once you have accumulated a surplus for investment, your trouble begins, but Oh what pleasant trouble! The main problem is to decide what proportion of your total savings you should put into fixed-dollar investments and what proportion to put into variable-dollar investments. Fixed-dollar investments consist of money put into bank accounts, life insurance, bonds, and also any money stored under the mattress. Variable-dollar investments consist of money put into real estate and stocks.

In the case of fixed-dollar investments, the amount that you will get back at some specified future date will be a certain specified number of dollars and cents. In the case of the variable-dollar investments, the amount that you will get at any particular future time will depend on the market price of the asset at that time, and there is no way of telling for sure just what that will be.

The advantage of fixed-dollar investments is that you are sure of the exact amount of money that you are supposed to receive. There may be some risk involved, depending on the agency which has the obligation. In the case of the United States Government bonds there is, for all practical purposes, a zero risk. In the case of insurance companies regulated by the states in which you are residents there is also virtually no risk, although in some states there have actually been failures of insurance companies. In the case of some corporate bonds, of course, there may be considerable risk of capital. Nevertheless, subject to whatever risk there may be as to whether the repayment will be made, the obligation is for a fixed amount. This greatly eases the problem of financial planning for the future.

On the other hand, the fixed-dollar obligation merely means that you will receive at some future time a certain number of dollars and cents, but there is no assurance that you will be able to buy a specific number or quality of goods and services. In other words, when you get the money the prices may have risen or fallen so that the amount of goods and services that you can buy is very different from the amount that you could buy at the present time. It should be emphasized that this works both ways: the prices may be lower

than now, so that in actual fact you will be getting more goods and services than you invested. Nevertheless, there is a risk involved—that is, a gamble—and the question is whether or not you want to take the gamble.

The advantage of a variable-dollar investment is that it will rise and fall more or less with the price level. Unless you happen to get a "lemon," investment in real estate may be expected to double more or less if the general price level doubles more or less. You cannot expect an exact correspondence between the price of your investment and the general price level at a particular time because, by definition, the general price level is "general." It is made up of a large number of different prices, some far above and some far below the "general" level which is, in actual fact, merely an average. You cannot expect to hit the average unless you have all of the components of the average, and this would require investment in hundreds of different commodities. Nor can you expect that the investment that you make will fluctuate in price with the general price level in any short period of time. As you know, prices, especially consumer prices, have been rising steadily; nevertheless, the stock market has shown a variety of reactions in recent weeks. The investment in variable-dollar investments cannot possibly guard you against such short-term fluctuations. The purpose of the variable-dollar investment is to hedge against major changes in prices, such as a doubling of prices which would impoverish you if you relied entirely on fixed-dollar investments.

The disadvantage of the variable-dollar investment is, of course, that you cannot be sure just what you will get at any particular future time. There is the additional difficulty that the particular stock or the particular piece of real property that you buy may have some peculiar problems so that it goes down when everything else is going up. The way to handle that problem is through diversification of investments, a matter which warrants separate attention.

Diversification of Investments.—Whether you make fixed-dollar investments or variable-dollar investments, or in whatever proportion you make them, you should diversify your investments; that is, you should not put all your eggs in one basket. There is absolutely no such thing as a sure thing. Some of the best governments have defaulted on their obligations, and some of the best companies have gone bankrupt. The only protection that you have is to spread your investments over a variety of issues. This does not mean that a lot of bad investments is better than a single bad investment. The idea is to spread your savings over a variety of *good* investments.

If you have a small sum of money, you can buy some Government bonds and also invest in a mutual fund which distributes your investment over a variety of different securities. If you have a larger sum of money to invest, you may yourself perform the function performed by the mutual funds by picking out, let us say, half a dozen industries and selecting a company in each industry. The industries and the companies that you select depend entirely on how much risk you wish to take. Of course, nobody wishes to lose his money, but you may feel that your other resources are such that you can take a chance on gaining a great deal even if that means that you might lose some or all of your

investment. On the other hand, if you do not want to take such a chance, you can concentrate on the more stable companies in the more stable industries. As for exact names of stocks and bonds, there is no problem whatever in getting this information from any broker; some of the brokerage houses prepare elaborate brochures breaking down the information exactly along these lines, and you would have no difficulty whatever in getting the information from them.

The important point that I wish to bring home, however, is that nobody can make for you the decision as to how much risk you wish to take regarding the value of your estate. The risk that you take will depend partly on your nature and partly on the need that you wish to meet. If you have dependents who will require a certain minimum of dollars and you cannot run the risk of their having less than that minimum, you will invest in Government bonds. On the other hand, if your dependents will be taken care of reasonably well, either through their own resources or through resources of yours, then you may be able to take the risk of leaving them very well off instead of just moderately well off, provided that you understand that they may actually get less in case of poor investment than if you had put all of your resources into Government bonds. A good investment adviser can reduce the risk of error and can indicate the probable consequences of different courses of action. You alone, however, must decide how much risk to take, that is, how much chance you are willing to take of losing some or all of your money in order to make a lot of money.

Tax-Exempt Securities.—One form of investment that many of you undoubtedly should look into is that of tax-exempt securities. Generally speaking, state and local bonds are exempt from both estate and Federal income taxes. Currently, it is possible to get good bonds of this sort yielding about 4 per cent. Now if you are in the 50 per cent tax bracket, that is the same as buying other bonds yielding 8 per cent. Some of you have undoubtedly experienced a rising income in the past few years but have not readjusted your thinking to take account of the new avenues opened up by the higher income. Tax-exempt securities offer a great opportunity to many of you, I am sure.

Use of Bonds for Estate Purposes.—The rise in the interest rate on Government bonds to 4 per cent presents an opportunity for saving money on estate taxes. Since there are a great many old bond issues that carry a lower interest rate, those old issues have fallen in price in order to raise their yield more or less to the 4 per cent level. Among these bonds are the 2½ per cent issues of 1962-67, 1963-68, 1964-69, 1965-70, 1966-71, and 1967-72; the 2¼ per cent issues of 1956-59 and 1959-62; the 3 per cent issue of 1995; and the 3¼ per cent issue of 1978-83. These issues are selling at from 3¼ per cent to 13 per cent below par, that is, below $100.00. Federal bonds can be used at par to pay the Federal estate tax. Thus, a bond which sells for $870.00 can be used to pay $1,000.00 worth of tax.

FOR THE FUTURE: TAX DEDUCTION FOR PENSION PREMIUMS?

There is under consideration at the present time the Jenkins-Keogh bill which would permit you, as self-employed persons, to take a tax deduction for

pension premiums. As you know, any amount paid by an employer into a pension fund is not regarded as part of the employee's current income and is therefore not subject to income taxation. The purpose of the bill is to extend to self-employed persons the same privilege of making part of their pension payments not subject to the income tax. This would be done by allowing self-employed persons to take, as a deduction from taxable income, premiums paid for pensions. Various professional organizations are actively at work trying to get this bill passed. It is understood at the present time that the chances are about 50-50.

If this bill ever goes through, you will have the problem of deciding how much of your current income to put into these pensions. There probably will also be an additional problem at that time. There is now under consideration by insurance companies the possibility of a variable annuity. Unlike the usual annuity which guarantees a certain fixed amount per annum, the variable annuity will rise and fall with the stock market. It would be much like buying into a mutual fund except, of course, that the insurance company guarantees the payment for your lifetime or for some other specified period that you may wish. At the present time the major companies are debating whether to go into this field. There are a few states in which such variable annuities are now permitted. Those of you who are on university faculties will know that the Teachers Insurance and Annuity Association has a variable annuity adjunct known as the College Retirement Equities Fund. Many university professors have put half of their pensions into this fund. This means that they have commitments for a fixed dollar amount for one-half of their pension and the other half will depend on the value of the stocks in the fund each year as they receive their retirement income. This is a desirable allocation.

SIGNIFICANCE OF THE SPUTNIK

The Sputnik has knocked every estate plan out of its orbit. At the very least, Sputnik shows that the Russians are capable of a "crash" program requiring a concentration of scientific, engineering, and administrative ability of the highest order. The very existence of Sputnik is conclusive proof of this. Even if this were all that one had to assume from the existence of Sputnik, it is a virtual certainty that defense expenditures in the United States will rise and that the long-range outlook is more inflationary than ever.

There is no evidence, however, that Sputnik does represent merely a "crash" program undertaken at the expense of other military preparations and the civilian economy. In fact, such indications as are available point in the direction of other military efforts of comparable degree of effort. If such is the case, who can say that we should cut down on research, development, and production in other areas, such as submarines, ships, artillery, and aircraft? Who shall say that we can safely cut down on stockpiling of metals, such as copper, lead, tin, and zinc?

The current fashion is to pretend to be undisturbed and complacent about the satellite. In fact, however, it is a virtual certainty that all elements

of defense expenditures will be expanded and that inflationary pressures will build up at almost as rapid a rate as in the early years of actual war. These inflationary pressures will be spread out over a longer period, we hope. Their over-all magnitude, however, will be equivalent to what we would encounter under wartime conditions. We are at the moment veering between a subdued crisis and a controlled panic. The panic will be kept under cover as long as possible and its effects will only gradually seep through, but seep through they must because they will show themselves in higher defense spending and greater inflationary pressures. Suggestions have been made by competent persons in various quarters that there is no need for additional defense spending: increased efficiency within the $38 billion defense budget could release the funds for an expanded satellite program. I am not dealing with what could be—merely with what will be.

Building an estate under such conditions requires adequate recognition of variable-dollar investments, such as real estate and stocks. Although every investment portfolio must still have a backlog of savings accounts, insurance, and Government bonds, it would be the height of folly to leave out investments which will vary more or less with the price level over the next ten, twenty, or thirty years. The distribution of stocks must also reflect the increased significance of defense expenditures in the economy. Industries and companies that will gain from the new defense expenditures must be represented along with the more stable industries, such as utilities and retail trade.

You may wonder why the stock market has not yet reacted to this inflationary outlook. The answer is that the stock market reacts to superficial considerations at any moment of time—it is scared by Sputnik, worried about the Middle East, apprehensive about business conditions. Hence, market prices are still low. That is a lucky break for people like you who now know that the outlook is actually inflationary and that the stock market will soon agree with you.

THE SCIENCE, PHILOSOPHY, AND ART OF ORTHODONTIC PRACTICE

A Summary of Forty Years of Orthodontic Experience and Observation

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(Continued from the October issue, page 791)

TREATMENT

ORTHODONTIC treatment consists of making changes in the three-dimensional relations and proportions of the teeth and their supporting tissues, in the temporomandibular joint (including all its component elements), and in voluntary muscular functional activities (including personal idiosyncrasies and habits). To these should be added the matter of timing, with respect to both its chronological importance as to the best time for instituting treatment and the rate at which changes should be carried into effect.

In making the changes which he judges to be desirable, the orthodontist has at his command four means for producing tissue readjustments. Two of these take full advantage of Nature's natural and unaided efforts at anatomic and physiologic readjustments, and the other two involve extraneous and artificial mechanical forces:

1. *Surgical interference,* which includes osteotomies and ostectomies in extreme cases and, that most controversial of all orthodontic subjects, extraction of teeth.

2. *Natural tissue readjustments* constantly operative throughout life due to growth, development, and functional changes and particularly noticeable and active after the extraction of teeth.

3. *Induced tissue readjustments,* either by unhampered volitional functional muscular efforts or induced by passive mechanical interferences, such as bite planes, guide planes, cribs, etc.

4. *Artificial mechanical pressures* produced by orthodontic appliances of all kinds and descriptions.

It stands to reason that in the course of treatment the less the forces of Nature are interfered with by mechanical appliances and the more the tissues can be altered by natural readjustments and induced functional changes, the more logical and natural is the treatment. This basic concept of

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treatment is diametrically at variance with the principles and methods employed in systems in which all the teeth are banded, Nature is hamstrung, and all the changes are subject to the skill of the operator and the mechanical limitations of a specific appliance.

If there is one basic principle of universal application more important than any other, it is hard to think of a more important one than the fact that form and function go hand in hand and are mutually interdependent on each other.

Placing the mandible in the position of optimum occlusal relation reveals the actual clinical problems concerned with each individual case so completely and with such simple clarity that the best techniques for the treatment of the patient suggest themselves as natural, logical sequences.

Of all the forces placed at the disposal of orthodontists, there is none more immediately available, more natural, and more important than the volitional functional exercise of the patient's own muscular efforts. These efforts can be helped immeasurably by removing the immediate and plainly obvious mechanical interferences which the positions of optimum occlusal relation reveal to be present at each successive step of the treatment.

Not to take full advantage of the patient's own intelligent, cooperative, volitional muscular efforts in his own desires for self-improvement is as sensible as building a steam plant on the banks of the Niagara and letting the natural water power, which is available for the taking, go to waste.

It has been said that anyone who has grasped a principle or method of approach which is universal in character has in his hands the only weapon applicable to infinite wariation. Techniques are mere servants to principle. When anyone takes over the technique of a predecessor without sharing the vision which animated it, he takes over a mental body but loses its immortal soul.

If there is any logic, reason, or common sense in the fact that the position of optimum occlusal relation reveals more clearly than any other means available the sum total of all the structural, functional, and esthetic problems of each individual case in one single composite mental picture, then it is equally important to realize that each individual picture is unique and calls for all the originality, mechanical ingenuity, and inventiveness of which orthodontists are capable in the selection of the best mechanical means available as aids to Nature. In this respect, there is quite a selection available, and some of the means are so infinitely better suited than others to meet individual clinical conditions that it is the height of stupidity not to be elective in this respect, rather than to hang doggedly to some mechanical gadgets which often interfere with the actual efforts of Nature herself. It is time that we should be getting rid of the "tyranny of specific appliances" and the narrow-minded arrogance which their exclusive use seems to generate.

At the present stage, no man can do more than present his own viewpoints and methods of procedure in the all-important questions of treatment

so that they may be freely judged and criticized. There can be no progress without active, intelligent, and constructive criticism, to which no open-minded man should take offense.

The soundness of any philosophy depends on the degree with which its principles and techniques are in harmony with the immutable laws of Nature, and it should be accepted or rejected on that basis. There are several fundamental scientific principles to which any sound system of orthodontics must, of necessity, conform.

Practical results are obtained by effecting individual tooth movements, functional changes, and bodily readjustments of the mandible. These should be in harmony at all times with our already well-established knowledge of histology, anatomy, and physiologic adaptability. In accordance with this knowledge, every tooth movement should be carried into effect by no means other than gentle, continuous pressures on individual teeth, with these movements coordinated in such a way that there may be but a minimum of traumatic occlusion while these movements are taking place between the teeth in the opposing jaws.

Changes in position and growth of the mandible can be produced only where these changes are possible. These are mainly in the region of the temporomandibular articulation, including the neck of the condyles and the ascending sections of the rami. These can be induced only by appliances that permit such freedom of movement that the functional efforts of the patient at all times may be utilized to the utmost advantage and not hampered by artificial mechanical interferences.

An orthodontist need hardly go further than to ask himself these fundamental questions in deciding on several of the most vital problems at hand and the methods and types of appliances that he may reasonably employ in dealing with them. The ingenuity of free-thinking orthodontists has already provided the necessary implements with which to cope, adequately and safely, with all these basic biologic problems.

The simplest and most direct way of considering the actual problems encountered in everyday practice and the methods of dealing with them is by the presentation of case reports. A careful selection of cases which involve extremes of variation makes quite clear the logical objectives of treatment and the principles of universal application which may be employed in attaining them. This eliminates a lot of tiresome abstract theorizing. In my own practice these principles of procedure are just four in number and belong in logical sequence to one another.

The first and most important principle, or action of procedure, is to study the position of occlusal advantage in its most comprehensive aspect and allow full rein to one's creative imagination, tempered, of course, by logic and common sense. This is the nearest approach to reducing to a single mental picture the entire panorama of any case with its individual problems and the means of treatment best suited to them.

The second principle consists of devising for each successive step in treatment the appliances best suited to the problems of the moment, coordinating the actions of the appliances used in the opposing jaws in order to avoid all possible trauma and allow the utmost freedom of movement of both the jaws and the teeth while changes are taking place.

The third principle of treatment is that, as action is followed by reaction which is never quite predictable, a complete re-evaluation of the entire case should be made at each visit of the patient. The position of occlusal advantage should be constantly studied in minute detail. Depending entirely on the changes which have taken place between visits, the decision should be made whether to continue with the means which are being employed or to discard them for something entirely different, either because the effect has not been what was expected or because the desirable changes which have been obtained suggest something entirely different for the next move.

Treatment is based on strategy from start to finish—not the strategy of this or that appliance, but an all-inclusive strategy which may include the use of all types of appliances as long as they are used at the time best suited to the problem at hand.

The fourth principle is that as orthodontic treatment is performed on living, functioning human tissue, subject at all times to the voluntary muscular efforts and intelligent mental cooperation of the individual for whom the work is being done, no work should be undertaken without having first prepared carefully the groundwork to ensure these efforts to the utmost during the entire time that the case is under treatment. The qualities that an orthodontist should have are actually those of a good field general.

If these principles of procedure have any merit, it is just as important that the means employed in carrying the desired changes into effect should be in complete harmony with them. This involves the selection of appliances as well as the control of the muscular and mental efforts which must be exercised. It is entirely logical and practical to coordinate all of them. In my own practice, I employ five types of appliances which I also place, in accordance with my own methods of procedure, in their respective order of importance.

1. *The plain labial arch with the infinite variety of labial auxiliary springs adaptable to its use.* This appliance makes possible every conceivable individual tooth movement without disturbing basic anchorage, and it also permits the simultaneous movement of anchor teeth with other individual tooth movements without the movements of the one interfering with those of the other.

2. *Bite planes in every form and description* for the reason that through their use we make available the natural force of occlusion not only to produce tooth movements but, still more important, to produce bodily movements of the mandible in its cranial relationships, and changes in the temporomandibular articulation. In the light of practical results and the rapidity with which

some of these mandibular changes take place, it would seem that some of the most important anatomic changes that occur as a result of treatment are mainly in the necks of the condyles. In some of these spectacular mandibular changes, the entire functional pull of the muscles is altered with untold benefits to the function of mastication and to facial contour as well.

3. *Lingual arches with the infinite variety of auxiliary springs that may be used with them.* These are the only logical appliances to be used for some tooth movements. In the forms of cribs or guide planes ("a rose by any other name would smell as sweet"), they have their very definite place. There is a very subtle line of demarcation between guide planes and removable plastic bite planes in treatment.

4. *The Joseph Johnson twin wire labial appliance,* which is par excellence the best suited for cases in which the compensatory effect of its gentle pressure can be exerted simultaneously on a number of teeth, particularly multiple incisors. In skillful hands, and in accordance with Dr. Johnson's methods of procedure, it has a very great latitude of usefulness.

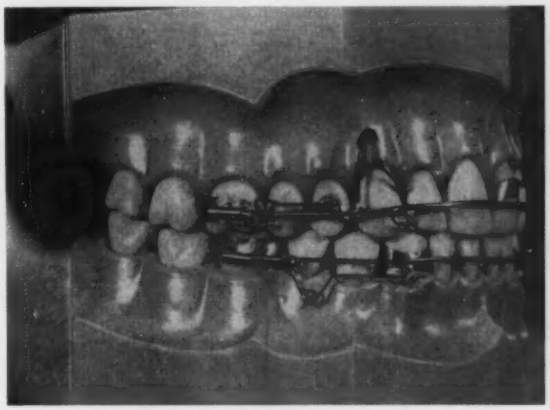


Fig. 41.—A typical setup of labial arches with labial auxiliary spring.

5. *The so-called Crozat removable appliance.* The detailed construction and field of usefulness of this appliance have been fully described in a previous article.*

It should be said that the originators of appliances, such as Joe Johnson and George Crozat, and their closest disciples can accomplish results with specific appliances that few imitators can entirely duplicate. This is not an unmixed blessing, as there is no appliance that is universal in its application and there is nothing comparable to freedom of choice in making selections for specific problems.

Naturally, everyone has a personal preference. If I were given the choice of one appliance and only one for the treatment of all cases, I would choose, without one moment's hesitation, the labial arch with labial auxiliary springs,

*Jackson, A. F., The Nature and Place of Removable Appliances in Orthodontic Treatment, AM. J. ORTHODONTICS 39: 818, 1953.

for there is no appliance that is more universal in its application. There is not a single tooth movement that cannot be accomplished with this appliance, and there are some that no appliance but this one can accomplish.

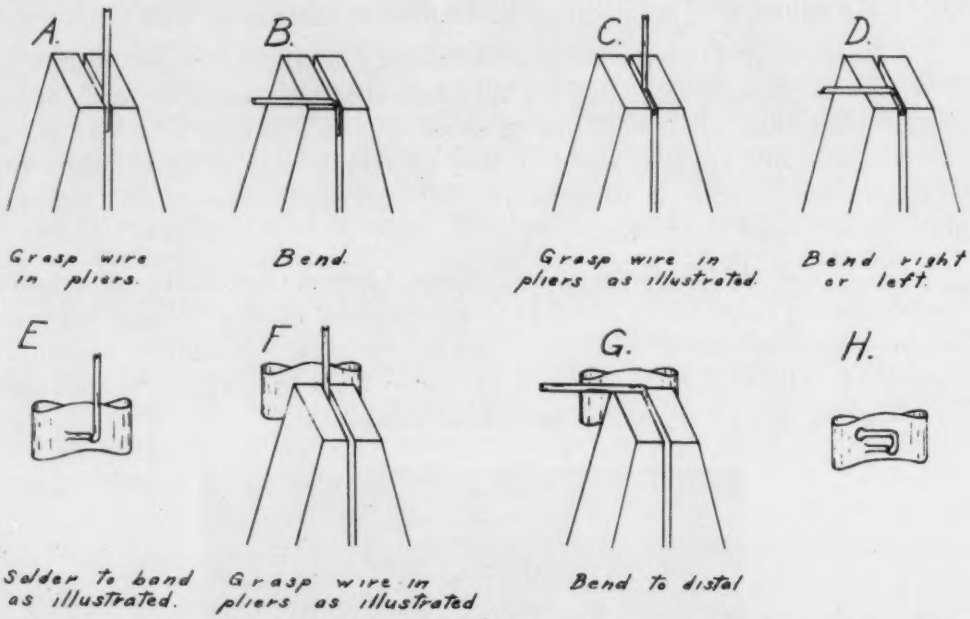


Fig. 42.—Details of the construction of the "bracket hook." Bending of the knobbed ends of the hooks holds the free ends of the auxiliary springs securely in place. This is done in a matter of seconds.

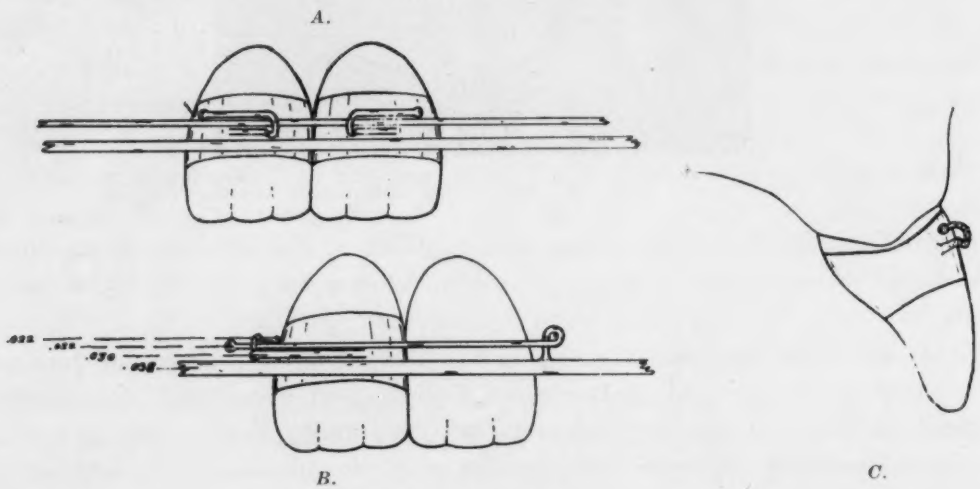


Fig. 43.

Figs. 44 to 47 show a variety of labial arches with auxiliary springs of various descriptions. The different combinations that can be devised to meet unique and unusual situations are limited only by the originality and ingenuity of those who employ them. In cases of distoclusion with deep overbites, the position of occlusal advantage may indicate that a downward and backward

Fig. 44.

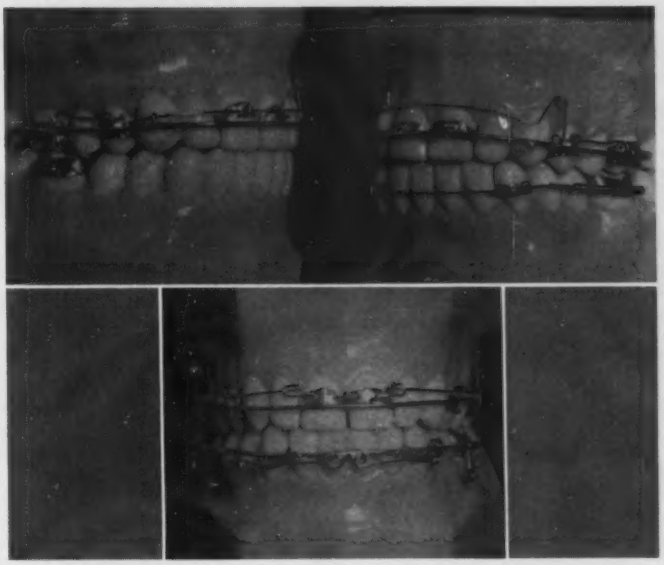


Fig. 45.

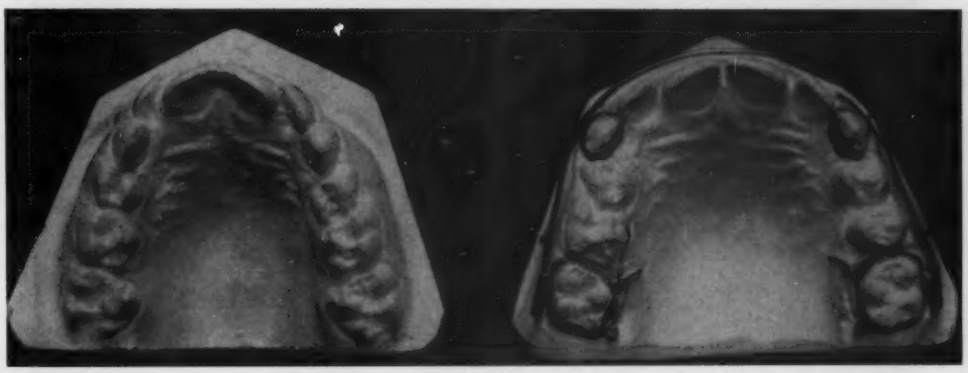


Fig. 46.—Gentle expansion of the arches by means of the plain labial arch and auxiliary springs induces natural rotations and alignment of crowded incisors without individual mechanical pressures.

Fig. 47.—There is nothing simpler and more effective to bring incisors in linguoversion into alignment than the labial arch and auxiliary springs. This method is particularly effective in cases of palatally impacted canines.

movement is desirable for the molars and premolars, while at the same time a gentle intrusive and retractive movement is indicated for the incisors. I know of no appliance that will perform this double action more perfectly. The appliance shown in Fig. 44 is a plain labial arch with short auxiliary springs to stabilize the arch with the first premolars and a long, very flexible

Fig. 48.

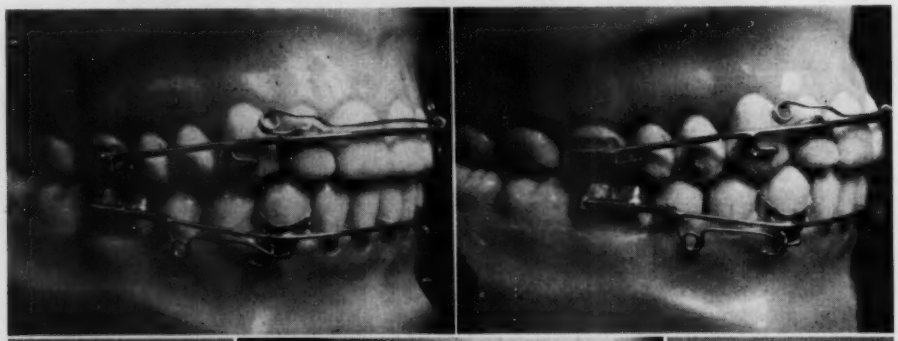


Fig. 49.

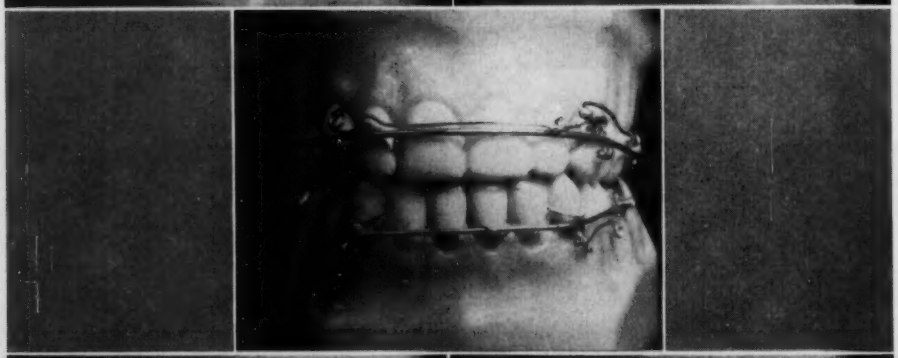
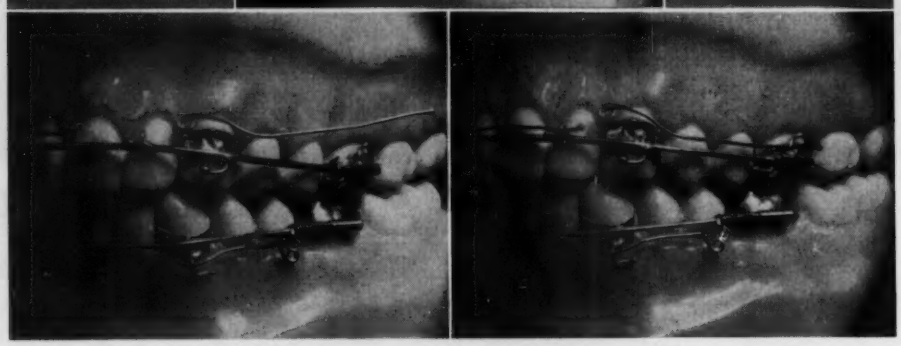


Fig. 50.



Figs. 48 to 50.—Possibly the most effective way of rotating teeth and altering their axial inclinations is by means of soldering long auxiliary springs to bands on the teeth to be moved. The free ends of the auxiliary springs are tucked and secured under hooks soldered to the labial arches. Here again gentle continuous pressure is enlisted to produce the desired effects acting singly and independently. This method is a lifesaver for uprighting molars.

labial auxiliary spring soldered to the arch on one side (usually the left, from habit), as illustrated, with the other end lying freely in a loop soldered to the arch on the opposite side. The uses to which this spring may be employed are practically unlimited. It may be bent to almost any shape desired, and it is very gratifying to see the results that three weeks or a month of treatment will produce on the teeth. This is particularly the case where it has been

desirable to both intrude and retract the incisors. For lack of a better name, we have, in my office, dubbed this appliance the "double boiler" because of the fact that it is a double arch and is the one least likely to overdo or produce harmful effects in what is being attempted. Its most desirable feature lies in the fact that in making adjustments the relationship which these bear to the outline of the main arch can be clearly seen at all times. There is no appliance less dangerous in the hands of the beginner than the plain labial arch with auxiliary springs.

MANDIBULAR ANCHORAGE

The problem of adequate mandibular anchorage is one of extreme importance, especially when intermaxillary force is employed. This is recognized by all good clinicians, many of whom have written at length on the subject

Fig. 51.

Fig. 52.

Figs. 51 and 52.—The mandibular labial arch with auxiliary springs placed within bracket hooks on the mandibular canines and ligated to the incisors affords an anchorage for intermaxillary traction incomparably superior to the plain lingual arch.

and have suggested different means of obtaining it to the best advantage. Among these could be mentioned Drs. Walter Bedell, Stephen Hopkins, and very recently William Wilson, who has used an appropriate term, "mandible conditioning," as a prerequisite necessity before employing intermaxillary

force. After trying many types of appliances, I have found that the appliance shown in Figs. 51 to 54 meets my own peculiar requirements better than anything I have used so far.

Fig. 53.

Fig. 54.

Fig. 55.

Again it is the old reliable plain labial arch and labial auxiliary springs which are called into action, in this case with the auxiliary springs exerting their beneficent effects on the mandibular canines. In a large number of cases these canines require rotating anyway; when this is accomplished by the means illustrated, the activating force is exerted gingivally to the fulcrum of the labial arch and thereby a gentle continuous pressure of great potential and stability is employed to great advantage. If lengthening of the arch or distal movement of the molars is desired, short coil springs can be utilized between

the attachment of the auxiliary springs and the buccal tubes. The mandibular central and lateral incisors may be stabilized either by ligating them to the labial arch or by employing any of the various forms of hooks or brackets.

For satisfactory results, the lingual arch requires great delicacy of construction and adjustment and is beneficially effective only when placed very accurately at the gingival margins of the teeth. It does not take full advantage of the powerful canine anchorage just described, especially when the rotating force of torque is further added.

As the coronal positions of the mandibular teeth are controlled by the shape of the labial arch, judicious pressure from auxiliary springs applied gingivally to the labial arch may produce torque, rotations, or depressions of these teeth in a gentle, continuous manner without the danger of the ill effects which occur when harsher methods are employed. Sometimes the mere supraclusion of one or both mandibular canines is the sole interference that prevents a perfect occlusion. Depressing them gently permits also just enough labial expansion for the proper alignment of the other incisors.

The labial arch with auxiliary springs as shown in Fig. 53 is par excellence the easiest and most effective means of rotating mandibular canines, and in addition it adds far greater stability to mandibular anchorage.

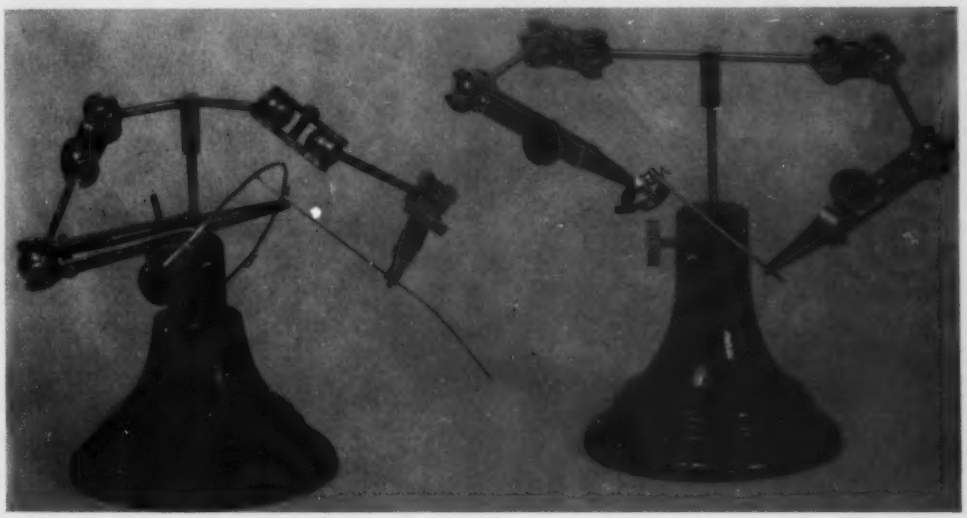


Fig. 56.—Elliot soldering pliers.

THE LINGUAL ARCH LOCK

The main purpose of the lingual arch lock, of course, is to hold the lingual arch securely in place. There are a number of forms of these locks, of which vertical sections of half-round tubing are probably the most popular. Like everything else, these have both advantages and disadvantages.

For many years I have been using a form which has many of the qualifications that I find necessary and desirable. It is formed of a short section of

round tubing soldered vertically on the distolingual region of the molar band and a loop or hook soldered in the mesio-gingivo-lingual region. The tubing is of a size to accommodate a post of 0.036 gauge wire which is soldered on the distal end of the arch. This is tied in place, as illustrated in Fig. 57, *A*.

One advantage of this form is that in cases of very short molars only very short sections of tubing are necessary which, together with the tie-loops, give two-point stable anchorage without impinging on the soft tissues. Another advantage is the rotation of the molars themselves with fairly gentle continuous pressure by means of the auxiliary spring lock as shown in Fig. 58.

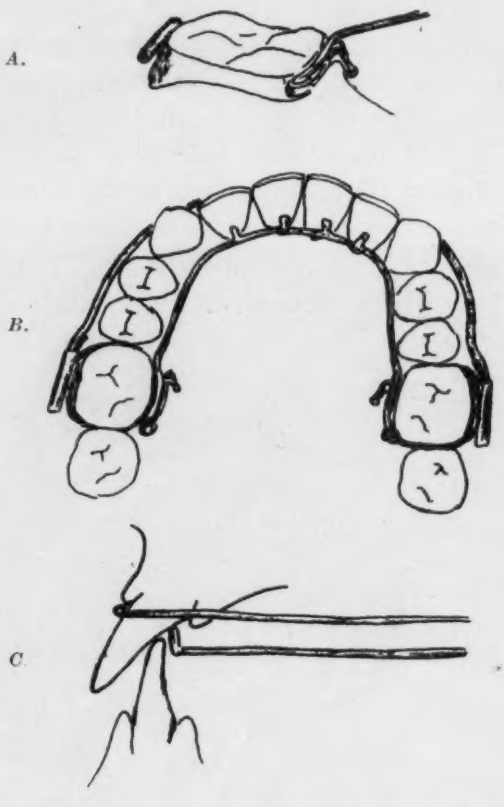


Fig. 57.

In cases of unilateral distoclusion it is often desirable to move the premolars and canines on the side in neutroclusion buccally in order to permit the mandible to move to that side. An auxiliary spring to produce this movement produces a reciprocal distal movement on the molar on the opposite side, which is just what is desired. This is possible only when the posts in the arch locks can rotate freely in the tubes.

The round tube lock makes it comparatively simple to construct lingual arches directly in the mouth. This is a great advantage for many reasons. A good technician with a little experience can construct them quite rapidly and in one continuous piece. For the beginner, however, it makes it much easier to construct them in two sections as shown in Fig. 55. The shorter

sections should be fitted in the mouth only with long sections of wire soldered to them temporarily. This is to facilitate handling and, above everything else, to prevent them from getting out of hand and lodging possibly in the trachea. The two sections are then cut where they meet and are soldered together. This is where the Elliot soldering pliers (the crab) come in very handy.

The two points of attachment of the lingual lock shown in Figs. 57 and 58, consisting of round vertical tubes soldered to the distolingual surfaces of the molar bands with bracket hooks soldered to the mesiolingual surfaces, are practically a "must" in cases of very short molars. Either hooks or loops are quite satisfactory as a means of tying the arches into place. When it is desirable to rotate molars, this can be done very easily and gently by soldering a heavy auxiliary spring of 0.030 inch wire to the lingual arch just mesial to the vertical post and bent so that the free end will lie under the loop as illustrated in Fig. 58. In cases of this kind it is necessary to use loop mesial attachments. The auxiliary spring lying under the loop acts both as a lock and as a rotating force when activated.

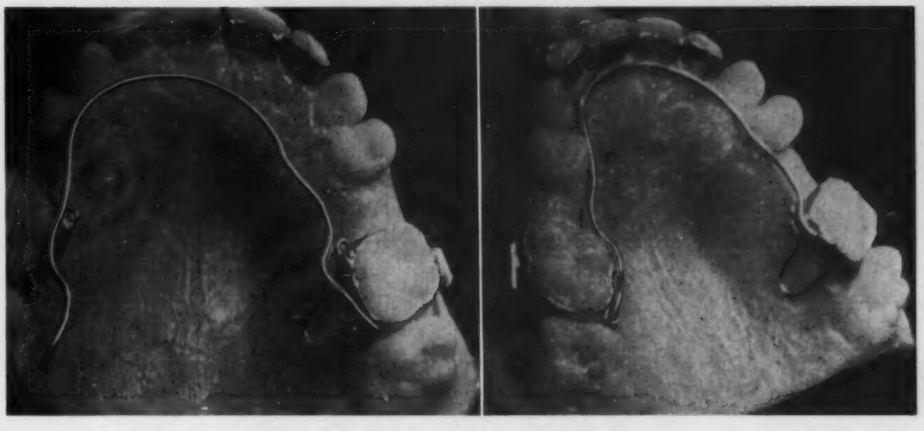


Fig. 58.

The are some cases in which the use of the Johnson twin wire appliance is so ideally suited to requirements that to report the results of treatment is merely to pay tribute to the contributions which Dr. Johnson has made to orthodontics. Figs. 67 and 68 show a condition in which the reciprocal force of the twin wire arch on several teeth makes treatment simple and effective. Fig. 69 shows the appliance construction, and Figs. 70 and 71 show the case after treatment.

THE CROZAT APPLIANCE

The Crozat appliance does not employ any bands but combines many of the most desirable elements of mechanical therapy. It has been used exclusively and with notable success by only a very few but some of our most able orthodontists, and, in my opinion, it deserves far greater attention than it has been accorded so far.

Fig. 59.

Fig. 60.

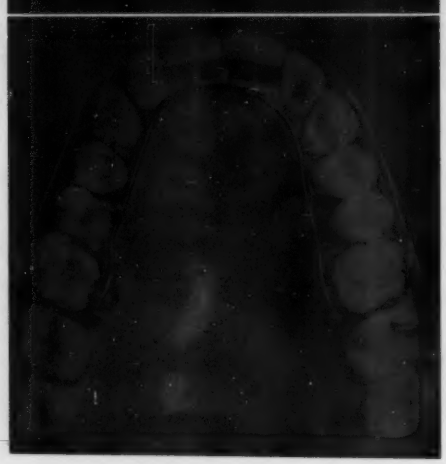


Fig. 61.

Fig. 62.

Fig. 63.

Fig. 64.

Fig. 65.

Fig. 66.

Fig. 67.

Fig. 69.

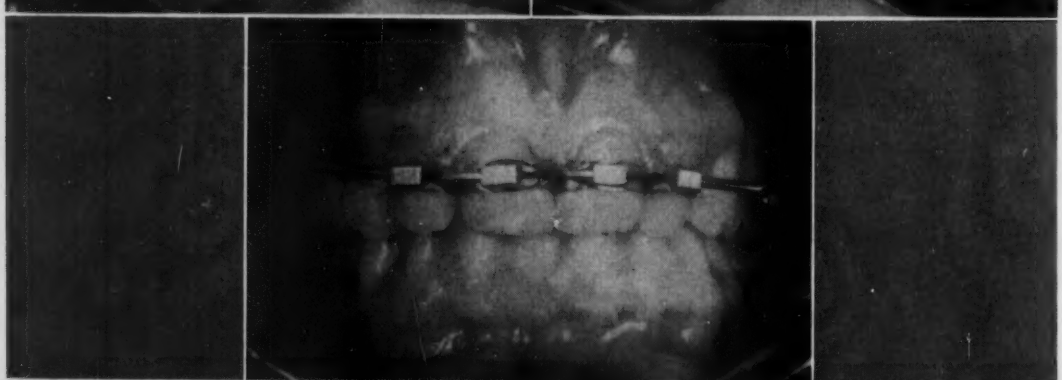
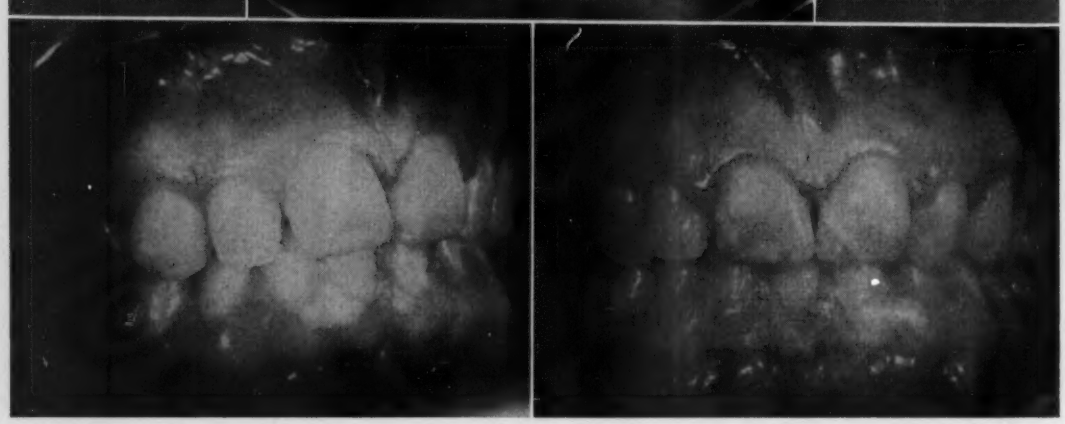


Fig. 70.



I have no desire to convey by this article that these appliances are suitable to all cases or that they are any panacea for all our orthodontic problems. They are, by comparison, like another useful club in the bag of a golfer or another brush in the hands of an artist.

Anchorage is naturally obtained by clasping appropriate teeth on both the right and the left sides of the arches, and these are connected by heavy 0.051 inch wire which is bent to shape as shown in Figs. 72 and 73.

Fig. 72.

Fig. 73.

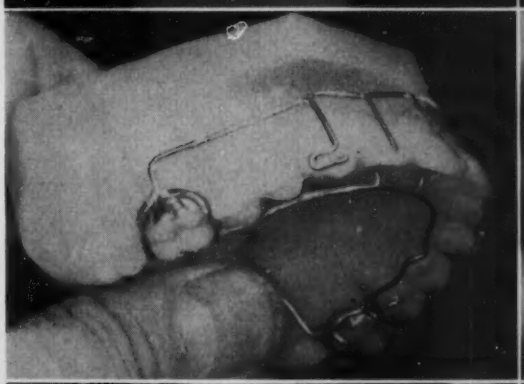


Fig. 74.

Fig. 75.

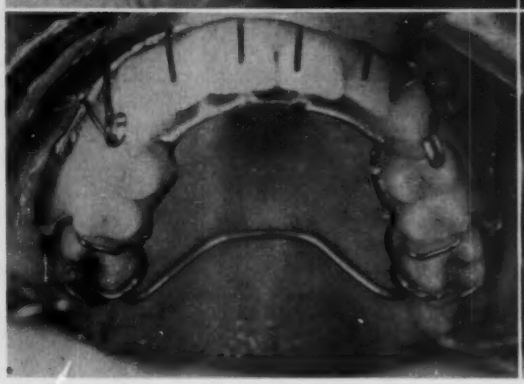


Fig. 76.

Fig. 77.

Extension wires of 0.036 inch gauge then are added on both the lingual and the buccal surfaces, as shown in Figs. 74 and 75. Also, short pieces are added from the lingual surfaces of the clasp wires over the occlusal surfaces for a few millimeters to prevent the clasps from riding too far gingivally.

Infinite variety of both buccal and lingual attachments may be added, limited only by the resourcefulness and ingenuity of the operator, who must bear in mind at all times the basic principles of coordinating the movements

of the maxillary and mandibular teeth and applying to the teeth to be moved only pressures gentle enough not to disturb the anchorage of the teeth which it is not desirable to move.

As I have used lingual cribs, guide planes, bite planes, etc., in the way of lingual attachments throughout my orthodontic career, I have found no difficulty in attaching all these forms to the lingual aspect of the Crozat appliances. One example of this is shown in Fig. 77.

The factor of the removability of the Crozat appliance, as may be well understood, is both an asset and a liability. It is unsatisfactory in cases in which the shape of the molars is unfavorable to obtain a sufficient amount of grip and also in cases in which the patients will not wear the appliances faithfully.

Fig. 78.—Models of patient 5½ years of age with cross-bite treated entirely with upper Crozat appliance.

Among those who are unfamiliar with the use of the Crozat appliance, the first question asked is nearly always: "How do you get youngsters to keep these things in place?" Fig. 78 shows models of a 5½-year-old child. This was a case of cross-bite, the child being able to bite as shown in Fig. 78. This case was treated entirely with the appliance shown in Fig. 80. The expansion of the maxillary arch was produced entirely by opening the loop of the palatal bar. It will be noted that the attachments were on the two deciduous second molars.

At this point it might be well to emphasize very emphatically that among the movements that can be effected with Crozat appliances some are comparatively easy and involve very little risk of damage and others require a great deal of skill. All of the movements that involve changes in the position of the anchor teeth require great skill to avoid damaging the tissues and involving the operator in technical difficulties. As already mentioned, the expansion in the deciduous molars shown in Fig. 79 was produced by opening the loop of the palatal bar. This is done by making very accurate and careful bends, and the use of a special pair of pliers was required to do it most effectively. (These are pliers No. 112, made by the S. S. White Dental Manufacturing Company.) I would strongly advise the beginner not to attempt a movement of this kind in his first case and, even after he has gained a considerable amount of experience, he should feel always that he is treading on

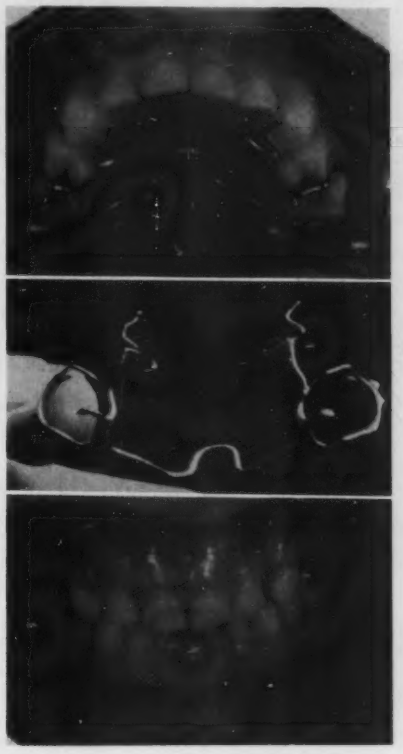


Fig. 79.

Fig. 80.

Fig. 81.

Figs. 79 to 81.—Result of treatment of case shown in models in Fig. 78.

very dangerous ground. The amount of expansion attempted each time should not exceed 1 to 2 mm.; this can be measured by placing the appliance on a piece of paper and marking the end of the landmarks which may seem desirable and then placing the arch which has been altered over these landmarks so as to see exactly how much change has been produced.

The use of the Crozat appliance in adult cases opens an almost unlimited field of usefulness, not only in improving conditions in which fixed appliances

would be undesirable but also for doing preparatory work for restorative dentistry prior to the construction of bridges, etc.

The case shown in Figs. 82 to 84 is that of a young woman, a teacher in her late 20's, to whom fixed appliances on the maxillary teeth would have been a source of embarrassment. The first form of the Crozat appliance to be used, after the extraction of the maxillary first premolars, was similar to the one shown in Fig. 77, which is very inconspicuous in the mouth. The

Fig. 82.

Fig. 83.

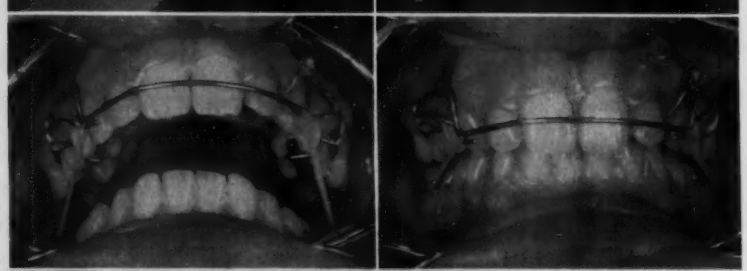
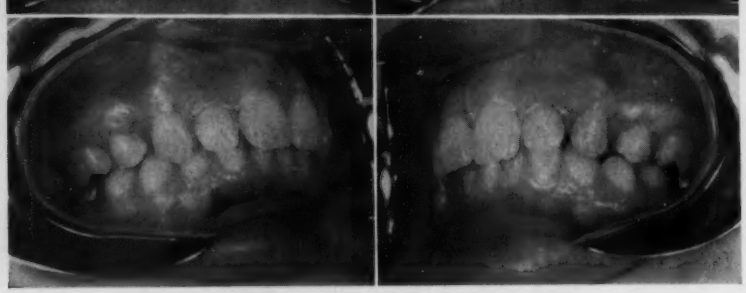


Fig. 84.



retraction of the incisors and canines was commenced with gentle finger springs on the canines. It is essential not to disturb molar anchorage at any time during treatment. This was ensured by reinforcing the appliance, which is quite rigid in itself, with a plastic palatal section to act both as a rest and as a means by which to open the bite. The mandibular incisors were in marked supraclusion, and these were aligned and depressed in the first stages of treatment by means of a plain labial arch and auxiliary springs. Toward the end of treatment, as shown in Figs. 83 and 84, the labial mandibular arch was replaced by a ligual arch located at the gingival margins of the teeth. Throughout the entire treatment a slight amount of intermaxillary force was employed to offset the retractive force on the incisors and to guarantee still further the stability of the maxillary molars. At the present time the patient is wearing the appliance shown in Figs. 83 and 84. Comparing the

condition shown in Figs. 82 and 83 with the present condition, shown in Figs. 83 and 84, it would seem that the Crozat appliance has a definite place in orthodontic therapy.

In presenting case reports, the first and most important fact to be realized and never forgotten for one instant is that there is no duplication in Nature, either in the original arrangements of the dental organs or in their reactions to treatment. The only things which really matter are the understanding of certain basic principles which are applicable to the unique set-up of the individual not only at the start but at every step in treatment until the final objectives have been attained.

The problem of open-bite is purposely presented, as a few details of the present method of treatment of these baffling cases have been among the most satisfactory technical improvements made in years.

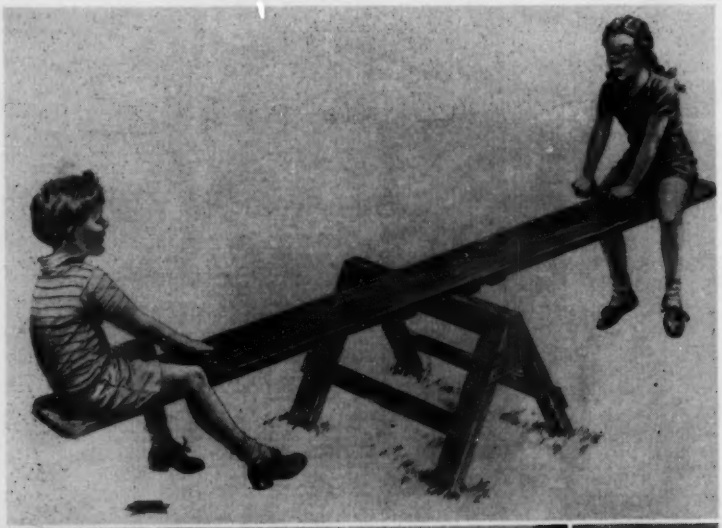
As every experienced orthodontist knows, the functional and esthetic conditions which are present in open-bite cases are so very unfortunate for the patient, and the prognosis for successful treatment is so pessimistic, that the orthodontist is quite justified in making any compromise with the natural state of affairs which may offer any prospect of improvement. In the first place, if there is crowding of the teeth it is far preferable to consider some judicious extractions rather than to undertake the dangerous risk of making the case worse by "conservative" treatment, and in this connection the types of appliance to be used are of paramount importance.

As for conservative treatment employing lingual arches in the "on again, off again, gone again, Finnegan" variety of their application, it has been my observation that this method is practically guaranteed to transfer open-bite conditions from the frying pan into the fire with a minimum loss of time. The same may be said for the use of any form of artificial denture which involves the palate. As I think we are all fully aware that some form of tongue habit is practically always present in connection with these cases, it is categorically imperative to avoid the use of any type of appliance which will aggravate the misuse of this unruly organ.

On general principles, mechanical therapy is based on the intelligent use of the dynamic force generated in the appliances in coordination with the volitional muscular efforts of the patient. There is no limit to the ingenuity which may be employed by orthodontists in devising unique appliances to meet specific individual conditions. Generally speaking, however, the strategy of using reciprocal force to achieve desirable tooth movements, although quite often in opposite directions, is a sound principle of practice. If we look, therefore, at open-bite as it usually exists, it is obvious that from an anatomic standpoint it is desirable to depress (if that is possible) the molars and elongate the incisors. If this can be accomplished by one and the same appliance acting reciprocally, it contains a sound mechanical principle which is in line with logic and common sense.

The appliance shown in Fig. 86 is based on the simple principle of the ordinary seesaw shown in Fig. 85, on which most of us have disported ourselves while still in short trousers. The details of its construction, as applied to orthodontics, are as follows: The buccal attachments on the molars should be very short sections of tubing or mere rings and *much too large* for the buccal arch which lies in it. (The purpose of this is to make this attactment, for all practical purposes, a "swivel" joint). In many cases of open-bite the

Fig. 85.



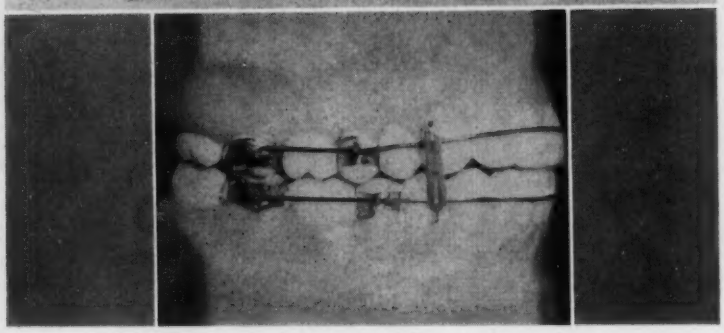


Fig. 86.

Figs. 85 and 86.—The appliance shown in Fig. 86 demonstrates the principle of the seesaw action as applied to the teeth. When elastic pressure is applied at the point shown, the effect is to produce pressure downward on the maxillary premolars and reciprocal pressure upward on the maxillary molars. Coincident with this action, there is pressure upward on the mandibular premolars and corresponding pressure downward on the mandibular molars.

second molars are the only teeth in occlusion; therefore, these are the most desirable teeth to band. If the molar bands are placed on these teeth, the buccal arch tied to brackets on the second premolars (which are in non-occlusion), and downward pressure from intermaxillary elastics applied mesially to the premolar attachments, the mechanical dynamics of the "see-saw" are set in motion. I have found, from practical experimentation, that a flexible labial arch of 0.030 inch seems to be the most effective to use. In addition to the definite mechanical effect of depressing the molars and

elongating the fulcrum teeth and those mesial to them, the intermittent pressure-and-release force derived from the elastics in the opening and closing of the jaws puts into effect one of the most desirable forms of physiologic force that can be used in orthodontics.

In the first stages of this treatment it is desirable to use the simple form of the appliance shown in Fig. 86 until the open-bite in the premolar region has been closed. By the time this has been effected it is usually found that the original condition of "open-bite" in the incisal region has been about half closed. At this point it is desirable to band the incisors as shown in Fig. 87 and to continue the use of the elastics until the bite is fully closed. The arch wire should not be heavier than 0.030 inch, so as to allow considerable flexibility. This is the most satisfactory method, yet found, for treating this condition.

Fig. 87.

Fig. 88 represents a case of open-bite in which a number of deciduous teeth are present but shortly to be exfoliated. Active treatment was not started until the permanent teeth had erupted and the premolars could be banded. The first step in treatment was to correct a cross-bite of the right molar, after which the dynamics of the "seesaw" appliances were put to work precisely as described. The result is shown in the models in Fig. 89. No retention appliances have been used since these models were made, and the result seems to be holding.

The retention for open-bite cases, as all experienced orthodontists well know, is a matter of major importance. I have found the double screen illustrated in Fig. 90 to be one of the most effective appliances ever devised for this purpose. This appliance was first shown to me by the late Dr. Oscar

Henry of London, who devised it either by himself or in collaboration with his associate, Dr. Smith. As open-bite cases are practically always associated with the habit of protruding the tongue between the teeth, the use of this appliance is a most effective way of correcting this habit. Although the appliance may appear cumbersome, the most amazing feature about it is that

Fig. 88.

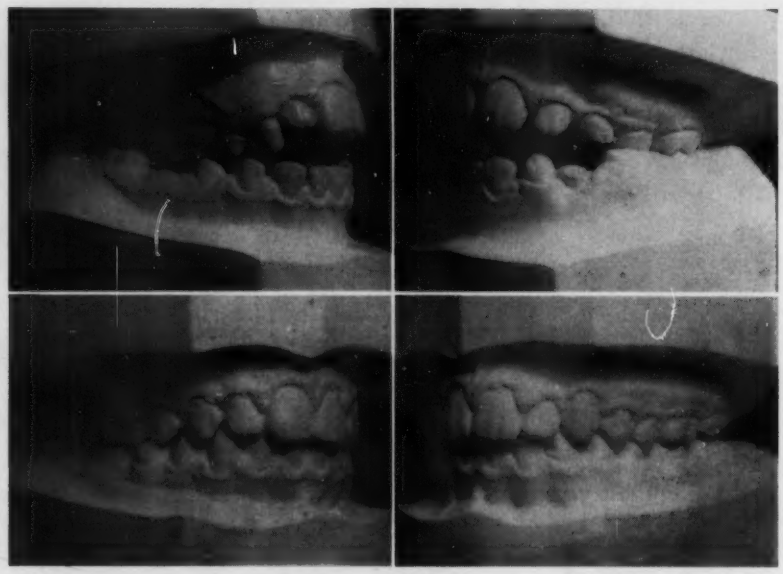


Fig. 89.

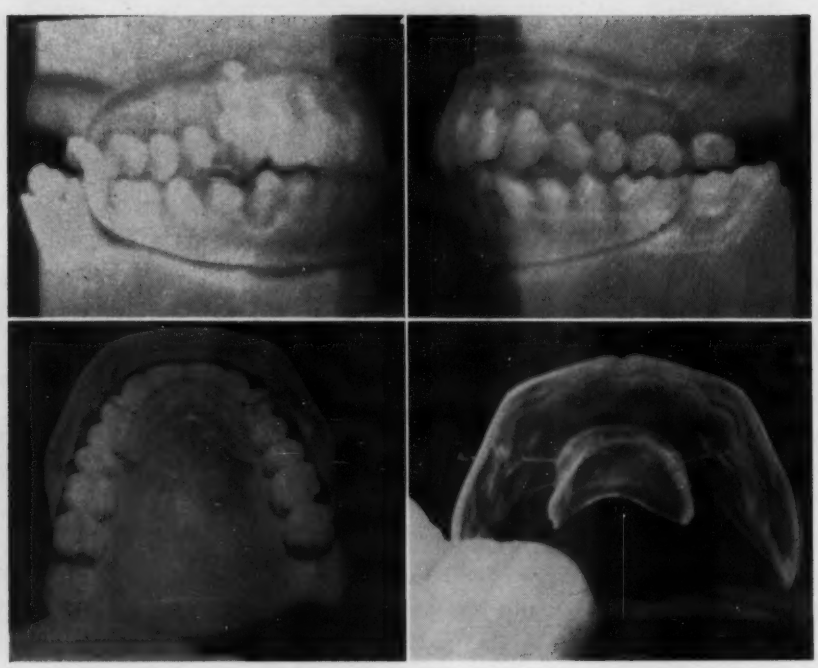


Fig. 90

patients offer very little objection to its use. This is negligible compared to Kesling positioners. The single vestibular screen is used with extraordinary success by some European orthodontists in correcting protrusive incisors.

The construction of the double screen offers a few technical difficulties, which may be greatly reduced from now on by the use of some of the newer self-curing acrylics. It is necessary for its effective use that the two segments of the screen be connected by thin flexible wires which should be placed at convenient places so as not to interfere with the occlusion. The laboratory which has made these screens for me so far has constructed them in two operations. The vestibular screen is first processed with the connecting wires embedded in it on the labiobuccal side, the free ends extending lingually through the occlusion. These free ends are then bent to shape and embedded in the lingual segment of the screen. It is exceedingly desirable, if not mandatory, that these screens be made of clear acrylic as in their adjustment there may be (and usually are) spots which impinge on the soft tissues, and the blanching which is produced can be clearly seen and relieved by a little judicious grinding. The benefits of transparency that permits one to see what is going on are obvious.

CONCLUDING REMARKS

In the fullness of perfection every orthodontist should be a creative genius. No man can possibly achieve that goal, but he has the inestimable privilege of having a whole lifetime of endeavor to progress toward that end. He can hardly ask for more out of life than to become a really good orthodontist. He is engaged in a labor that is creative and artistic to the highest degree. The results of his efforts are for the benefit of his fellow man and are usually very much appreciated.

No true orthodontist should ever want to quit. Even though his physical powers may wane, his judgment should develop finer acuteness the longer that he lives. The great musical genius Wagner, in his old age, asked nothing more of life than to feel the creative urge and to have the time and health to exercise it. All else to him was a compromise with the vulgarity of everyday living. One thing is certain: No orthodontist can possibly escape the infinite variations of the factors that he has to deal with. The permanent satisfactions of his life depend on how well he has developed in himself those talents which alone will enable him to cope with them successfully. A baseball player or a prize fighter reaches the pinnacle of his career at an early age. An orthodontist, like a good diplomat or a judge, matures with age.

The final argument in favor of an orthodontist never retiring is that as long as life persists it still offers him the opportunity to atone, in part, for some of the inexcusable stupidities which he has undoubtedly committed in the past.

Orthodontic Profiles

HERBERT A. PULLEN

IT HAS been said that the first man to limit his practice to orthodontics in the territory east of the Mississippi River was Dr. Herbert A. Pullen. Through his efforts, a great deal of the pioneer work was done to establish the specialty of orthodontics and to set high standards for this special practice.

Dr. Pullen was born in Evansville, Wisconsin, in 1873 and was graduated from the University of Minnesota in 1893 with the D.M.D. degree. He practiced general dentistry in Green Bay, Wisconsin, for a while and then enrolled in the first class of the Angle School of Orthodontia in St. Louis. After graduation in 1900, he became one of the first instructors in that institution. He then accepted a teaching position in orthodontia at the Forsyth Clinic in Boston, Massachusetts, and shortly afterward he established his office in Buffalo, New York, for the exclusive practice of orthodontia.

During the early years of practice, he traveled to Rochester, New York, for additional practice, but the latter had to be abandoned later when it became too burdensome for him to conduct in addition to his Buffalo practice.

Dr. Pullen contributed much to the specialty of orthodontics by presenting many essays and clinics to the various dental and orthodontic societies. The titles of such contributions pertained to materials and design of appliances and diagnosis and treatment of various types of malocclusions. He designed many orthodontic instruments, such as the Pullen band-forming plier, band-removing plier, band seater, etc. The seamless molar and incisor bands, which are still on the market, were originally designed by him.

A partial bibliography of articles by Dr. Pullen was printed in his obituary in the *Dental Cosmos* (**77**: 521, 1945). Two articles which appeared in the report of the First International Orthodontic Congress held in New York City in 1927 indicate the nature of some of his work. These articles were entitled "Abnormal Habits in Their Relation to Malocclusion and Facial Deformity" and "Treatment of the Deep Underbite With the Inclined Plane."

Another significant article appeared in the *Dental Cosmos* of May, 1912, namely, "Expansion of the Dental Arch and Opening the Maxillary Suture in Relation to the Development of the Internal and External Face." We have seen this principle of treatment reborn more recently in the use of the palatal expansion plate.

At a meeting of the American Laryngological, Rhinological, and Otological Society held in Philadelphia, Pennsylvania, on May 14, 1912, special reference

was given to the above-named literature in a symposium by the Eastern Association of Graduates of the Angle School of Orthodontia. The men who appeared on this symposium were most carefully chosen to represent the specialty of orthodontia. The panelists, with their particular subjects, were Drs. Milo Hellman (topographical anatomy), F. L. Stanton (physiology), J. Lowe Young (treatment), E. Santley Butler (treatment), and B. W. Weinberger (bibliography).

At about the same time, or earlier, Dr. Pullen wrote the chapter on orthodontia in C. N. Johnson's book on operative dentistry, which was considered the Number 1 book in dentistry in that period.

HERBERT A. PULLEN

Dr. Pullen was a member of the Eastern Association of Graduates of the Angle School of Orthodontia. He served as president of the American Society of Orthodontists in 1906-1907 and as president of the New York Society of Orthodontists in 1922-1923.

He served as professor of orthodontia at the University of Buffalo Dental School from 1919 to 1934, at which time he resigned because of poor health. During the year previous to his resignation from the faculty, he was invited to appear before the Pacific Coast Society of Orthodontists to present essays and clinics. The effort that he made in appearing before that Society seemed to be too fatiguing for his reserve strength and later, while vacationing in Florida, he suddenly died.

All who knew him had the greatest amount of respect for him as a gentleman as well as for his professional qualifications. He had been an elder of Westminster Presbyterian Church. He belonged to the Buffalo Club and the Buffalo Country Club. His main hobby was golf.

At the time of his death, Dr. Pullen was survived by his wife, the former Claire Smith of Buffalo, and a brother, Lester L. Pullen of Massena, New York. Another brother, Ralph, who had preceded him in death, was formerly associated with Dr. Albert Ketcham of Denver, Colorado.

Those of us who follow in the footsteps of these great pioneers in the specialty of orthodontics should be most grateful for the high standards which they set for future orthodontists to follow.

Clifford G. Glaser.

Editorials

ETIOLOGY IN ORTHODONTIC DIAGNOSIS

PERMANENCE of results in the prevention and correction of malocclusion, as of other physical defects, depends primarily upon the recognition and elimination of the etiological factors involved. In past years the frame of reference of orthodontists has been the chosen "system" of appliance therapy by means of which they treated the defect and all but lost sight of the child. This has seen a gradual change. Orthodontists have practiced satellization ever since the advent of E. H. Angle. There are at present, however, just as many "cults" and "cultists" in orthodontics as ever. Today almost every orthodontist is someone's man.

The tendency to confuse description of malocclusion (that is, classification by the method of Angle, by roentgenographic cephalometrics, and by other means) with etiology (the actual causative factors involved) still exists among orthodontists. While cephalometrics may localize the malocclusion and indicate where the discrepancy lies, it does not reveal the actual etiological factors.

As may be seen in the findings of the first Roentgenographic Cephalometric Workshop, present methods of cephalometric analysis are far from a scientific certainty. The same holds true of the relative stability and importance of landmarks, angles, and planes so far advocated. There is still a great deal to be done and much to be learned before the orthodontist can use roentgenographic cephalometric analyses, even for descriptive purposes, with a high degree of assurance.

Cephalometrics alone, important as it is, holds forth no formula for successful orthodontic prevention and therapy. There are many other factors to be considered. These must be clarified before orthodontic therapy can be removed farther and farther from its present largely empirical and pragmatic state.

It is hoped that the second Roentgenographic Cephalometric Workshop, now being planned by the Special Committee of the American Association of Orthodontists, will lead to more information and wider application, so that this universally recognized valuable tool will be truly productive.

When considering basic etiological factors—for example, such deleterious genetic and environmental influences as poor nutrition, childhood diseases, and habits—we should remember that these are not invariably productive of malocclusion. Malocclusion in the individual patient cannot, at least at present,

always be reduced to a simple cause-and-effect process. Specific etiological factors are practically unknown as far as malocclusion is concerned. There are, however, certain precursors of malocclusion which must be eliminated or at least checked in their early stages if we expect to prevent malocclusion or to treat it successfully, once malocclusion has manifested itself.

Serial extraction, now so widely practiced, is a case in point. This procedure requires a fine diagnostic sense and wide clinical experience, especially as to *whether* and *when* it should be performed. One must avoid mistaking the transitory malocclusions which evidence themselves during the developmental stages of dental eruption for patent malocclusion. Failure to heed the above will relegate *serial* extraction to limbo, together with *random* extraction when practiced without accompanying orthodontic intervention.[1]

Continuing research in electromyography affords the opportunity of detecting muscular disturbances responsible for the manifestation of many types of malocclusion. Until electromyographic testing of the individual patient becomes routine procedure, all talk about muscle balance achieved in treatment is meaningless.

Bone physiology is at present hardly understood by most practicing orthodontists. Great strides are being made in this field, and orthodontists would do well to delve into and acquaint themselves with the progress made.

The greatest contributions to the knowledge of the etiology of malocclusion may well come from research in experimental embryology.[2] The recognition of DNA (desoxyribonucleic acid) as the chemical that determines heredity is bound to lead to greater progress in the understanding of congenital anomalies and malformations. If malformations can be produced in the fetus by DNA changes, it should be possible also to obviate malformations by proper use of DNA. Experimental embryology indicates that whereas the genotype determines whether a malformation will occur, pre- and postnatal environment which produces the phenotype, while itself responsible for the occurrence of malformations, also determines the severity with which malformations will manifest themselves.

Vitamin deficiencies in the mother have been found to be productive of a large variety of dentofacial malformations. Nutritional evaluation of the child about to undergo orthodontic therapy has long been recognized as important. It is, nevertheless, largely ignored in practice. Certain diseases in the expectant mother are known to be causative factors in the malformations of the offspring. Attention to endocrine imbalance is frequently lacking among orthodontists except when the patient shows manifest endocrine deficiency. It is well known that even when endocrine imbalance is not severe, it may adversely influence growth and development.

Blackman and Greening[3] point out: "The possessor of an x-ray apparatus should bear in mind that he is operating a lethal machine and that it is his duty to acquaint himself fully with the hazards, both to his patient and to himself. . . ." Malformations caused by illness of the mother and by radiation may show themselves later in the life of the child and not be evident at birth.

The "appliance system" approach to the correction of malocclusion will invariably end in failure if we continue to ignore basic etiological factors. Greater interest in basic etiological research is important. Orthodontists should seek the collaboration of workers in the related fields mentioned and in other cognate sciences in order to enrich orthodontic knowledge.

J. A. S.

REFERENCES

1. Salzmann, J. A.: A Preliminary Report on Tooth Movement After Loss of the First Molar in 500 Adolescents, INT. J. ORTHODONTIA **23**: 662, 1937.
2. Salzmann, J. A.: Basic Etiological Factors in Dentofacial Malformations, AM. J. ORTHODONTICS **42**: 702, 1956.
3. Blackman, Sydney, and Greening, J. R.: Radiation Hazards in Dental Radiography, Brit. Dent. J. **102**: 167, 1957.

Inasmuch as the matter of the use of *orthodontics* versus the use of *orthodontia* has become more and more confusing in the publication of orthodontic manuscripts, the editor needs direction.

Obviously, one of the two terms should be used consistently in the JOURNAL. With this thought in mind, the Publication Board has been consulted. One member, Dr. B. F. Dewel, happens to be a member of both the Publication Board and the Committee on Nomenclature. Accordingly, Dr. Dewel was asked to express his views editorially.

Dr. Dewel's views and his references on this subject follow.

—Editor.

ORTHODONTIA OR ORTHODONTICS

A PROFESSIONAL specialty has the responsibility of naming matters pertaining to its particular branch of learning so that they have an unmistakable meaning to other sciences and professions. Yet, questionable terminology remains a common problem for editors of all scientific publications. For more than twenty-five years nomenclature committees of the American Association of Orthodontists have been advocating the adoption of the etymologically correct *orthodontics* in preference to the traditional *orthodontia.* The trend in new editions of all dictionaries—medical, dental, and general—is to list *orthodontics* as the preferred name for the specialty. The most recent work specifically to recommend the term *orthodontics* is Denton's *Vocabulary of Dentistry and Oral Science,* published in 1958 by the American Dental Association. Still the question of *orthodontia* versus *orthodontics* continues to be the principal problem in terminology for editors of orthodontic journals.

In modern scientific nomenclature the meaning of a word is determined by its derivation, and most of the terms are combinations of nouns and adjectives from other languages, chiefly Greek and Latin. To these are added prefixes and suffixes that modify or define the roots or primary elements of the new term. Usually a word passes through several changes before it gains universal approval. This has been true of *orthodontics;* at one time, for example, it was known as *orthodontosie.*

There is no question about accepting the first two elements in the word. *Orth-* is a combining form derived from the Greek *orthos* and is variously interpreted as meaning straight, upright, regular, and correct. There is only one meaning for *odont-;* it is derived from the Greek *odous* (or *odontos*) and means tooth.

The problem lies in which suffix is to be used to describe the nature of the specialty. A fine sense of loyalty to the customs and traditions of a previous generation is shown by the men who continue to favor the *-ia* termination; yet proper usage, as determined from the meaning of the two suffixes, requires adoption of the *-ics* ending. Complete definitions of the combining elements, *orth-* and *odont-*, and of the two suffixes, *-ia* and *ics*, can be found in any college-level dictionary as well as in the large unabridged editions used for reference purposes.

The *-ics* suffix is derived from the Greek adjective *-ikos;* in early Greek times it was used without a noun to denote an art or a science. Now it is used in forming nouns pertaining to a particular subject (for example, *acoustics, mathematics,* and *electronics*). Dictionaries give various meanings to *-ics,* but the general implication is that it is to be used in the names of arts, sciences, and systematic studies, as in *esthetics, metaphysics,* and *therapeutics.* In dental and medical etymology the *-ics* ending is the preferred form not only in the names of sciences but also in matters of professional practice, as in *orthopedics.*

Before 1500 the names for branches of learning as they came into English usage were given the *-ic* termination, as in *music, logic,* and *arithmetic;* now *-ic* serves chiefly to form adjectives, such as *orthodontic.* Since the sixteenth century, the *-ics* ending has been used in the singular sense to denote a body of matters, facts, and knowledge pertaining to a specified subject—thus, *economics, hydrostatics, optics,* and *prosthetics.*

Dictionary definitions place a more restricted application on the *-ia* suffix; it is not used to name broad areas of learning. Although it is employed occasionally to denote a condition (*anesthesia,* for example), at no point is the *-ia* ending specifically identified with a professional practice. Instead, Greek medical writers added the *-ia* suffix to the name of a part of the body to indicate a diseased condition, as in *ophthalmia, leukemia, neuralgia,* and *hysteria.*

The classic example is *pneumonia;* Hippocrates devised the term by combining *pneumon* (Greek for lung) and *-ia* (Greek for disease). Even in this sense, the *-ia* ending is losing its popularity in modern medical etymology; it has been superseded in newly formed terms by another Greek suffix, *-itis,* which denotes an inflammation or inflammatory disease. Apparently, Hippocrates intended no particular distinction between *-ia* and *-itis,* for he also used the words *arthritis* and *nephritis* with the same meaning as they have today. In a similar manner, *-ia* is being supplanted by another specific Greek suffix, *-osis,* as in *neurosis.*

The *-ia* termination otherwise is confined to certain limited fields, principally as a noun-forming suffix in geography (*Prussia*), botany (*fuchsia*),

biology (*mammalia*), alkaloids (*morphia*), festivals (*Bacchanalia*), and in forming plural words (*bacteria*).

None of these implies that the *-ia* suffix can be used to indicate a science or a practice, which is the purpose of the name for a professional specialty. The *-ia* ending in medicine or dentistry suggests either a condition or a disease. Thus, when *-ia* is added to *orth-* (straight) and *odont-* (teeth), it implies a condition of straight teeth or a disease of straight teeth. That is hardly the meaning which the name is intended to convey.

Orthodontics is not alone in having started out with the *-ia* suffix. As other dental specialties were established, they also used the terminal *-ia* and have since encouraged orthodontics' lead to the more precise *-ics* ending. In medicine the term *orthopaedia* also preceded *orthopedics.*

The origin of *pediatrics* is even more interesting. It arises from two Greek words: *pais* (or *paidos*), meaning a child, and *iatreia* (or *iatria*), meaning medical treatment or to heal. Other possible derivatives (*iatros, iatrikos,* and *iasthai*) are given in general dictionaries, but *iatreia* is the most frequent choice in medical dictionaries. Since the logical combination, *pediatria,* would not show that a practice was meant, it was discarded in favor of *pediatrics. Obstetrics* was formed in a somewhat similar manner; in Rome, an *obstetrix* was a midwife. All three medical terms had different origins; yet, each was changed to conform to the *-ics* ending to indicate a science or a practice.

In his comprehensive text, Denton comments: "*Orthodontics* is one of the most descriptive terms applied to a branch or specialty of dentistry. It indicates by the ending *-ics* that a practice is meant; by the element *odont-* it specifies the anatomical region concerned, and by the element *orth-* it suggests the character of the treatment."

In a personal communication, Dr. Denton makes this additional distinction: "The suffix *-ia* originally was only an ending signifying a feminine adjective or noun, which might attach to a word for any object or quality of that gender. The ending was also present in Greek in the names of some sciences and other subjects, as in *anatomia* and *astronomia.* This ending is represented in English by *-y,* as in *anatomy* and *astronomy.* In most cases, where there could be any doubt, the *-y* does not stand alone but is preceded by another element, such as *log-,* to indicate more specifically that a science is designated, as in *biology, histology,* and *bacteriology.*

"Although it is possible to represent a science or a profession etymologically by the *-ia* ending, as in *orthopedia* or *orthodontia,* the suffix is too general in its import. An ending that is unmistakably specific, such as *-ics,* is much to be preferred. This is the argument for *orthodontics* rather than *orthodontia.*"

This problem in orthodontic nomenclature is greater in Europe than in the United States. This is due as much to the multiplicity of languages as it is to a similar confusion over the meaning of the *-ics* and *-ia* suffixes. In addition to *orthodontics* and *orthodontia,* terms currently in use in Europe are *orthodontie, ortodoncia, orthognathodontia, orthognathopedics, orthodontology,*

ortodontopedia, kieferorthopädie (jaw orthopedics), and *maxillo-facial-dental orthopedics.* Our problem with only two terms is minor in comparison, but it gives us the greater obligation to choose the one which is the most precise and the least confusing.

B. F. Dewel, Chairman
Nomenclature Committee
American Association of Orthodontists

Erratum

In the Annual Report of the Sectional Editor of the Northeastern Society of Orthodontists, which appeared on page 707 of the September, 1958, issue of the JOURNAL, an error was made as to the author of the report. The report should have been signed by Joseph D. Eby of the Northeastern Society instead of by Raymond C. Sheridan of the Middle Atlantic Society. The JOURNAL regrets the error and is glad to make this correction.

In Memoriam

William W. Martin
1883-1958

WILLIAM W. MARTIN, of 1372 Anthony St., Columbia, Missouri, died on Sunday morning, June 15, 1958, at the Boone County Hospital after an illness of ten days. He was 74 years old.

Dr. Martin was born near Odessa, Missouri, on Dec. 30, 1883, the son of James W. and Rachel Ramsay Martin. On Sept. 11, 1912, he married Miss Laura Dysart at Marshall, Missouri.

He attended Missouri Valley College and received his dental degree from the Kansas City Dental College. This was followed by a course at the Dewey School of Orthodontia. He served as a professor of orthodontics at the State University of Iowa for twelve years and was associated with Dr. Abram Hoffman in the orthodontic department at Northwestern University for eight years. In 1938 he opened his private practice in Columbia City.

Just recently the Alumni Association of the University of Kansas City School of Dentistry awarded Dr. Martin a fifty-year honorarium. At the time of his death he was eligible for membership in the Golden Anniversary Group of the American Association of Orthodontists.

During Dr. Martin's active years, he was affiliated with the various societies related to his profession. In addition, he was an elder in the First Presbyterian Church for forty years, a member of the Masonic Lodge, White Shrine, and Eastern Star.

Surviving are his widow; three daughters, Mrs. W. L. Shilling, Cames, Washington, Mrs. E. B. Rose, Berwyn, Illinois, and Mrs. J. H. Davis, Birmingham, Alabama; one brother, James F. Martin, Odessa, Missouri; and five grandchildren. We extend our sympathy to all members of his family.

BE IT RESOLVED that this tribute be made a part of our permanent file and that a copy be mailed to Dr. Martin's widow for the family record.

Respectfully submitted,

ARLO M. DUNN
H. B. SINGLER
LEONARD P. WAHL, Chairman
Necrology Committee

Department of Orthodontic Abstracts and Reviews

Edited by
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All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Anomalies of Infants and Children. By D. McCullogh Mayer, D.D.S., M.D. F.A.C.S., F.I.C.S. Associate Professor of Plastic Surgery, New York Medical College, and Associate Attending Plastic Surgeon and Head of Plastic Surgery Service, Flower and Fifth Avenue Hospitals, New York, and Wilson A. Swanker, M.D., F.A.C.S.. F.I.C.S., Professor of Plastic and Aesthetic Surgery, Ankara University, Turkey. New York, McGraw-Hill Book Company, Inc., 1958. 454 pages. Illustrated.

This volume should prove to be a valuable reference work for the orthodontist, since it will help him to discuss intelligently with parents and with others in interprofessional specialties the anatomic anomalies which the patient may show. Dr. E. P. Whelan, in his foreword, quotes Dr. William J. Mayo, who said: "Every human being has the divine right to look human." The foregoing should serve as an answer to orthodontists who are wont to belittle the esthetic value of their specialty. It should be remembered, nevertheless, that restoration of function takes precedence over cosmetics.

Anomalies, as far as teratology (the study of abnormal development) is concerned, can be considered as a group from the standpoint of etiology. The difference is one of degree and not of causation. The chapter on congenital anomalies is written in a summarily concise manner. It includes classification and etiology. The description of facial anomalies includes the consideration of clefts of the lips and palate. The team approach in the handling of these patients is advocated. It is interesting to note that the authors recognize the futility and even the potential harm of surgical operation on cleft palate in cases where the prognosis following surgery is unfavorable. Attention is given to the respective roles of the orthodontist and the prosthodontist in cleft palate treatment. Advice of the orthodontist, it is advocated, should be sought early. The authors fail, however, to point out the role of the orthodontist in the appraisal of developmental progress of the face, although they consider him valuable in the correction of malocclusion. Specific therapy and diagnosis are not discussed.

In the chapter on the mouth and oral cavity are discussed the various anomalies of the tongue and teeth. The book has omitted the discussion of the value of cephalometrics and of other diagnostic tools now used. To the orthodontist it provides a means of orientation in the related anomalies of the face, mouth, and teeth which should be helpful to him in the understanding of his own immediate problem.

J. A. S.

Growth and Development of Negro Infants. VIII. Comparison of the Deciduous Dentition in Negro and White Infants (A Preliminary Study). By Angella D. Ferguson, M.D., Roland B. Scott, M.D., and Harry Bakwin, M.D., *J. Pediatrics* **50**: 327-331, March, 1957.

This study was undertaken to compare (1) the time of eruption of the first deciduous tooth and (2) the number of teeth present at 1 year of age in Negro and white infants.

The data were secured from two free well-baby clinics and from a private pediatric practice. These groups represented normal healthy infants from families of low and middle socioeconomic levels in the Washington, D. C., metropolitan area. A group of white infants from upper middle-income families in New York City was observed in private practice and studied in a similar manner. The method employed was largely cross sectional; a few patients were followed longitudinally. Observations were made from 1953 through 1955. In this survey 808 Negro infants and 175 white infants were observed. Of the total number of Negro infants studied, 384 (47.5 per cent) were boys and 424 (52.4 per cent) were girls.

In comparing the study groups, statistically significant differences were found in the following categories:

1. In the Negro infants from private practice, both sexes erupted the first tooth at an earlier age than did the white infants from private practice (a difference of 2.8 weeks for boys and 3.9 weeks for girls).

2. When the total Negro sample (clinic and private) was compared with the white infants from private practice, it was found that the Negro female infants erupted their first tooth at an earlier age (2.7 weeks) than the white girls, and the white boys had more teeth (0.9 teeth) at 1 year than the Negro boys. The white female infants also had more teeth than the Negro female infants at the end of one year; however, the difference was only 0.5 teeth.

3. In comparing the two groups of Negro infants (clinic and private), significant differences were found only in the age of eruption of the first tooth, that is, the Negro male infants from private practice erupted the first tooth 2.7 weeks earlier than the Negro male infants from the clinic. The Negro female infants observed in private practice also erupted their first tooth earlier than the Negro female infants from the clinic, but the difference was only 1.3 weeks and was not statistically significant.

With respect to the white infants, the boys erupted their first tooth 2.5 weeks earlier than did the girls (eruption ages were 29.1 and 31.6 weeks, respectively) and had 0.5 more teeth at 1 year of age. In other studies of white infants from a similar socioeconomic level, an earlier eruption age in boys as compared to girls was also reported.

In comparing the two groups of Negro infants from middle and low socioeconomic levels (that is, private and clinic), the mean eruption times are earlier for the infants from the middle-class socioeconomic environment. However, in a comparison of the combined Negro sample (middle and low socioeconomic groups) with the white infants from a middle socioeconomic level, the eruption age of first teeth for both male and female Negro infants is earlier than that found for white infants. With respect to white infants, it is also interesting to note that although the first tooth erupted at a later age, these infants had more teeth at 1 year (a difference of 0.9 teeth in males and 0.5 teeth in females) than Negro infants.

It is possible that a natural tendency (racial or genetic) toward accelerated eruption in the Negro may compensate for unfavorable environmental (nutritional) needs.

Similarly, when the two racial groups are compared at the end of the first year of life, the nutritional advantages of the white infants will tend to overcompensate slightly for a natural genetic lag in early dentition. However, the white infants from private practice had a significantly greater number of teeth at the end of the first year than the Negro infants from the clinic (low socioeconomic level).

The Effect of the New Income Tax Regulations on Dentists.* Council on Legislation, American Dental Association.

On April 3, the Internal Revenue Service issued a new set of regulations governing expenses which may be deducted from federal income tax by persons engaged in businesses and professions. The new regulations were published in full in the *Federal Register* for April 5, 1958.

The sections of the new regulations governing traveling expenses, expenses for education and professional expenses are of special importance to dentists. Section 1.162-5 confirms specifically the dentist's right to deduct the cost involved in attending educational courses designed to improve his skill and learning within a field or fields of dentistry which he practices. That section of the regulation, however, specifically denies a deduction for the cost of an educational course designed to qualify a dentist to become a specialist.

The Internal Revenue Service has announced that amended returns for the years 1955, 1956 and 1957 may be filed by a person who took educational courses during those years, if those courses meet the tests of Section 1.162-5 and the person did not include the cost of the course or courses as a deduction.

EXCERPTS FROM NEW REGULATIONS GOVERNING BUSINESS EXPENSES†

§ 1.162-2 Traveling expenses. (a) Traveling expenses include travel fares, meals and lodging, and expenses incident to travel such as expenses for sample rooms, telephone and telegraph, public stenographers, etc. Only such traveling expenses as are reasonable and necessary in the conduct of the taxpayer's business and directly attributable to it may be deducted. If the trip is undertaken for other than business purposes, the travel fares and expenses incident to travel are personal expenses and the meals and lodging are living expenses. If the trip is solely on business, the reasonable and necessary traveling expenses, including travel fares, meals and lodging, and expenses incident to travel, are business expenses. For the allowance of traveling expenses as deductions in determining adjusted gross income, see section 62 (2) (B) and the regulations thereunder.

(b) (1) If a taxpayer travels to a destination and while at such destination engages in both business and personal activities, traveling expenses to and from such destination are deductible only if the trip is related primarily to the taxpayer's trade or business. If the trip is primarily personal in nature, the traveling expenses to and from the destination are not deductible even though the taxpayer engages in business activities while at such destination. However, expenses while at the destination which are properly allocable to the taxpayer's trade or business are deductible even though the traveling expenses to and from the destination are not deductible.

(2) Whether a trip is related primarily to the taxpayer's trade or business or is primarily personal in nature depends on the facts and circumstances in each case. The amount of time during the period of the trip which is spent on

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†Excerpted from Federal Register 23: April 5, 1958.

personal activity compared to the amount of time spent on activities directly relating to the taxpayer's trade or business is an important factor in determining whether the trip is primarily personal. If, for example, a taxpayer spends one week while at a destination on activities which are directly related to his trade or business and subsequently spends an additional five weeks for vacation or other personal activities, the trip will be considered primarily personal in nature in the absence of a clear showing to the contrary.

(c) Where a taxpayer's wife accompanies him on a business trip, expenses attributable to her travel fare are not deductible unless it can be adequately shown that the wife's presence on the trip has a bona fide business purpose. The wife's performance of some incidental service does not cause her expenses to qualify as deductible business expenses. The same rules apply to any other members of the taxpayer's family who accompany him on such a trip.

(d) Expenses paid or incurred by a taxpayer in attending a convention or other meeting may constitute an ordinary and necessary business expense under section 162 depending upon the facts and circumstances of each case. No distinction will be made between self-employed persons and employees. The fact that an employee uses vacation or leave time or that his attendance at the convention is voluntary will not necessarily prohibit the allowance of the deduction. The allowance of deductions for such expenses will depend upon whether there is a sufficient relationship between the taxpayer's trade of [sic] business and his attendance at the convention or other meeting so that he is benefiting or advancing the interests of his trade or business by such attendance. If the convention is for political, social or other purposes unrelated to the taxpayer's trade or business, the expenses are not deductible.

(e) Commuters' fares are not considered as business expenses and are not deductible.

§ 1.162-5 Expenses for education. (a) Expenditures made by a taxpayer for his education are deductible if they are for education (including research activities) undertaken primarily for the purpose of:

(1) Maintaining or improving skills required by the taxpayer in his employment or other trade or business or

(2) Meeting the express requirements of a taxpayer's employer, or the requirements of applicable law or regulations, imposed as a condition to the retention by the taxpayer of his salary, status or employment.

Whether or not education is of the type referred to in subparagraph (1) of this paragraph shall be determined upon the basis of all the facts of each case. If it is customary for other established members of the taxpayer's trade or business to undertake such education, the taxpayer will ordinarily be considered to have undertaken this education for the purpose described in subparagraph (1) of this paragraph. Expenditures for education of the type described in subparagraph (2) of this paragraph are deductible under subparagraph (2) only to the extent that they are for the minimum education required by the taxpayer's employer, or by applicable law or regulations, as a condition to the retention of the taxpayer's salary, status, or employment. Expenditures for education other than those so required may be deductible under subparagraph (1) of this paragraph if the education meets the qualifications of subparagraph (1). A taxpayer is considered to have made expenditures for education to meet the express requirements of his employer only if the requirement is imposed primarily for a bona fide business purpose of the taxpayer's employer and not primarily for the taxpayer's benefit. Except as provided in the last sentence of paragraph (b) of this section, in the case of teachers. a written statement from an authorized official or school officer to the effect that the education was

required as a condition to the retention of the taxpayer's salary, status, or employment will be accepted for the purpose of meeting the requirements of this paragraph.

(b) Expenditures made by a taxpayer for his education are not deductible if they are for education undertaken primarily for the purpose of obtaining a new position or substantial advancement in position, or primarily for the purpose of fulfilling the general educational aspirations or other personal purposes of the taxpayer. The fact that the education undertaken meets express requirements for the new position or substantial advancement in position will be an important factor indicating that the education is undertaken primarily for the purpose of obtaining such position or advancement, unless such education is required as a condition to the retention by the taxpayer of his present employment. In any event, if education is required of the taxpayer in order to meet the minimum requirements for qualification or establishment in his intended trade or business or specialty therein, the expense of such education is personal in nature and therefore is not deductible.

(c) In general, a taxpayer's expenditures for travel (including travel while on sabbatical leave) as a form of education shall be considered as primarily personal in nature and therefore not deductible.

(d) If a taxpayer travels away from home primarily to obtain education the expenses of which are deductible under this section, his expenditures for travel, meals, and lodging while away from home are deductible. However, if as an incident of such trip the taxpayer engages in some personal activity such as sight-seeing, social visiting or entertaining, or other recreation, the portion of the expenses attributable to such personal activity constitutes nondeductible personal or living expenses and is not allowable as a deduction. If the taxpayer's travel activity constitutes nondeductible personal the taxpayer's expenditures for travel, meals, and lodging (other than meals and lodging during the time spent in participating in deductible educational pursuits) are not deductible. Whether a particular trip is primarily personal or primarily to obtain education the expenses of which are deductible under this section depends upon all the facts and circumstances of each case. An important factor to be taken into consideration in making the determination is the relative amount of time devoted to personal activity as compared with the time devoted to educational pursuits. Expenses in the nature of commuters' fares are not deductible.

(e) The provisions of this section may be illustrated by the following examples:

Example (1). A is employed by an accounting firm. In order to become a certified public accountant he takes courses in accounting. Since the education was undertaken prior to the time A became qualified in his chosen profession as a certified public accountant, A's expenditures for such courses and expenses for any transportation, meals, and lodging while away from home are not deductible.

Example (2). B, a general practitioner of medicine, takes a course of study in order to become a specialist in pediatrics. C, a general practitioner of medicine, takes a 2-week course reviewing developments in several specialized fields, including pediatrics, for the purpose of carrying on his general practice. B's expenses are not deductible because the course of study qualified him for a specialty within his trade or business. C's expenses for his education and any transportation, meals, and lodging while away from home are deductible because they were undertaken primarily to improve skills required by him in his trade or business.

Example (3). D is required by his employer (or by State law) either to read a list of books or to take certain courses giving six hours academic credit

every two years in order to retain his position as a teacher. D fulfills the requirement by taking the courses and thereby receives an automatic increase in salary in his present position and salary schedule. Also, as the result of taking the prescribed courses, at the end of ten years, D receives a master's degree and becomes automatically eligible for an additional salary increase. Since D's purpose in taking the courses was primarily to fulfill the educational requirement of his employer, his expenses for such education and transportation, meals, and lodging while away from home are deductible.

Example (4). The facts are the same as in example (3) except that, due solely to a shortage of qualified teachers, D's employer does not enforce the prescribed educational requirements in that other teachers who do not fulfill those requirements are retained in their positions. D's expenses are nevertheless deductible.

Example (5). E, a high school teacher of physics, in order to improve skills required by him and thus improve his effectiveness as such a teacher, takes summer school courses in nuclear physics and educational methods. E's expenses for such courses are deductible.

Example (6). F takes summer school courses in order to improve skills required by him in his employment as a teacher. As a result of taking such courses F receives an in-grade increase in salary in his present position pursuant to a salary schedule established by the school system for which he works. F's expenditures for such courses are deductible.

Example (7). G, a graduate student at a university, plans to become a university professor. In order to qualify as a regular faculty member, G must obtain a graduate degree. While taking the required graduate courses, G is engaged in teaching at the university. G's expenses therefore are not deductible since he has not completed the education required to become qualified as a regular faculty member at the time at which he takes such courses.

Example (8). H, a self-employed tax consultant, decides to take a 1-week course in taxation, which is offered in City X, 500 miles away from his home. His primary purpose in going to X is to take the course, but he also takes a side trip to City Y (50 miles from X) for one day, takes a sight-seeing trip while in X, and entertains some personal friends. H's transportation expenses to City X and return to his home are deductible but his transportation expenses to City Y are not deductible. H's expenses for meals and lodging while away from home will be allocated between his educational pursuits and his personal activities. Those expenses which are entirely personal, such as sight-seeing and entertaining friends, are not deductible to any extent.

Example (9). The facts are the same as in example (8) except that H's primary purpose in going to City X is to take a vacation. This purpose is indicated by several factors, one of which is the fact that he spends only one week attending the tax course and devotes five weeks entirely to personal activities. None of H's transportation expenses are deductible and his expenses for meals and lodging while away from home are not deductible to the extent attributable to personal activities. His expenses for meals and lodging allocable to the week attending the tax course are, however, deductible.

§ 1.162-6 Professional expenses. A professional man may claim as deductions the cost of supplies used by him in the practice of his profession, expenses paid or accrued in the operation and repair of an automobile used in making professional calls, dues to professional societies and subscriptions to professional journals, the rent paid or accrued for office rooms, the cost of the fuel, light, water, telephone, etc., used in such offices, and the hire of office assistance. Amounts currently paid or accrued for books, furniture, and professional instruments and equipment, the useful life of which is short, may be deducted.

News and Notes

American Association of Orthodontists 1959 Meeting

The next session of the American Association of Orthodontists will be held at the Statler-Hilton Hotel in Detroit, Michigan, May 3 to 7, 1959. Officers are as follows:

President: C. Edward Martinek, 661 Fisher Bldg., Detroit, Michigan.

Secretary-Treasurer: Earl E. Shepard, 8230 Forsyth Blvd., St. Louis, Missouri.

Program Chairman: Scott T. Holmes, 1205 Peck St., Muskegon, Michigan.

Local Arrangements Chairman: Robert E. Coleman, David Whitney Bldg., Detroit, Michigan.

Local Arrangements Treasurer: Frank S. Cartwright, Henry Ford Hospital Detroit, Michigan.

Room reservations will be divided between the Statler-Hilton Hotel and the Tuller Hotel. These hotels are directly across the street from each other.

Shortly, forms for room reservations will be provided on which members may indicate accommodations desired. Should any member or guest seek reservations by means other than these forms, the method should conspicuously identify the applicant as being interested in the session of the American Association of Orthodontists. We suggest that any letters for hotel reservations be headed "Re: Meeting of the American Association of Orthodontists." Since the hotel is reserved for this meeting, it is possible that some may be refused who do not conspicuously announce their desires in this manner.

1959 Milo Hellman Award, American Association of Orthodontists

The annual prize essay contest of the American Association of Orthodontists will be held to determine the recipient of the 1959 Milo Hellman Award as well as other honors. Any member of the American Association of Orthodontists is eligible and encouraged to compete, as well as undergraduate, postgraduate, and graduate students of recognized institutions in the field of dentistry. Those research fellows and teachers of established orthodontic departments are also eligible to submit papers.

To be acceptable to the Prize Essay Committee, the paper must be an original writing and must include new material and findings that are important to the advancement of orthodontics. The essay judged to be the winner is awarded a prize of $500.00, whereas those selected for second and third places carry honorable mention awards. The Prize Essay Committee reserves the right to omit the award if, in its opinion, none of the entries is worthy of the honor and prize. The first, second, and third papers automatically become the property of the Association and will be published in this JOURNAL, subject to the editor's approval. All other essays are returned to the authors.

All entries for the contest must be postmarked no later than Jan. 8, 1959. The entries will be carefully judged by members of the Research Committee, and the author of the winning essay will be expected to present his paper as a part of the program of the American Association of Orthodontists to be held in Detroit, Michigan, May 4 to 7, 1959.

Specifications for prize essay contest entries are as follows:

The essay must be typewritten in English on 8½ by 11 inch white paper, double spaced with at least 1 inch margins. Each sheet must be numbered and either bound or assembled in a "brief cover." The title of the essay must appear on the "brief cover." Three copies of each essay, including all illustrations, tables, and bibliography, must be submitted, but the name and address of the author must not appear on or in the essay For identification of the essay, its title, its author's name, and a brief biographical sketch setting forth the author's professional training, present activity, and status (i.e., practitioner, teacher, student, research fellow) must be typed on a separate sheet of paper and enclosed in a plain envelope. The title of the essay only must appear on the envelope.

Further information regarding Research Committee activities may appear in News and Notes. In the meantime, address all inquiries to the undersigned.

J. WILLIAM ADAMS, Chairman
Research Committee
Indiana University School of Dentistry
1121 West Michigan St.
Indianapolis, Indiana

Detroit's new waterfront Civic Center. In the center foreground is the Veteran's Memorial Building; in the right foreground, the City-County Building; between the two, the huge Ford Auditorium, now completed has been added. Additional buildings, now under construction, are Cobo Hall, which is a 396,425 square feet convention exhibit building, and the Convention Arena Building, which will seat 10,000 people. This Civic Center is scheduled for completion in 1960.

American Association of Orthodontists, 1959 Research Section Meeting

One session of our annual meeting in Detroit, Michigan, May 4 to 7, will be devoted to ten-minute reports in abstract form of research being done or completed which pertains to the science of orthodontics. Reports prepared for this program by authors not in attendance may be read by title only. It is hoped that all research that is suitable in nature will be reported on in this manner on the occasion of the Research Section's meeting.

Each participant is asked to prepare a 250-word abstract for publication in the AMERICAN JOURNAL OF ORTHODONTICS. Both the abstract for publication and the ten-minute

oral report should be carefully prepared to present adequately the important elements of the investigation.

A special form for use in submitting the title and abstract will be circulated to all orthodontic departments and to any individual requesting one. In order to ensure proper timing and uniformity, a member of the Research Committee will have to edit the report as it is to be given. Reports, with accompanying forms, must be ready to submit Jan. 8, 1959.

J. WILLIAM ADAMS, Chairman
Research Committee
Indiana University School of Dentistry
1121 West Michigan St.
Indianapolis, Indiana

American Board of Orthodontics

The next meeting of the American Board of Orthodontics will be held at the Statler Hotel in Detroit, Michigan, April 28 through May 2, 1959. Orthodontists who desire to be certified by the Board may obtain application blanks from the Secretary, Dr. Wendell L. Wylie, University of California School of Dentistry, The Medical Center, San Francisco 22, California.

Applications for acceptance at the Detroit meeting, leading to stipulation of examination requirements for the following year, must be filed before March 1, 1959. To be eligible, an applicant must have been an *active* member of the American Association of Orthodontists for at least two years.

Central Section of the American Association of Orthodontists

The twenty-first annual session of the Central Section of the American Association of Orthodontists was held Sept. 29 and 30, 1958, at Hotel Roosevelt in Cedar Rapids, Iowa. The meeting was under the direction of Dr. Fred B. Lehman of Cedar Rapids. The scientific program was as follows:

A Longitudinal Study of the Dentition Between 3 and 18 Years of Age. C. F. Moorrees, Boston, Massachusetts.

Case Report. W. S. Brandhorst, St. Louis, Missouri.

An Efficient Treatment Routine. N. G. Gaston, Monroe, Louisiana.

Case Report. A. G. Brodie, Jr., Chicago, Illinois.

Recent Studies on the Growth of the Body and Face. H. V. Meredith, Iowa City, Iowa.

Case Report. James Guerrero, Chicago, Illinois.

Orthodontic Relapses Analyzed in a Study of Connective Tissue Fibers. H. E. Thompson, Kansas City, Missouri.

Rocky Mountain Society of Orthodontists 1958 Meeting

Dr. George E. Ewan closed his year as president by guiding one of the most successful and enjoyable sessions held in the Rocky Mountain area. Selection of the Jackson Lake Lodge, in Moran, Wyoming (a Rockefeller Foundation accomplishment) added greatly to the relaxation and clinical value of the thirty-eighth annual fall meeting held Sept. 7 to 10, 1958.

True western atmosphere and feeling prevailed in the picturesque area of the Grand Teton Mountains, whose significance and beauty cannot help but bring a sense of pride in a great country and make the orthodontist a bit humble as he views "what God hath wrought."

Drs. Alton Moore of Seattle, Washington, and James Jay of New York City presented a program of unusual interest. Dr. Jay's discussion, entitled "Total Extraoral Therapy," may well be considered a common-sense evaluation of an overly complicated and mechanically indoctrinated therapeutic approach to the correction of one of mankind's shortcomings.

Cephalomatic diagnosis received a refreshing treatment by Dr. Moore and will undoubtedly be made a real adjunct to the orthodontic treatment planning, if such thinking is continued.

Jackson Lake Lodge. This magnificent lodge is built on a wooded knoll overlooking Jackson Lake and facing the snow-capped 12,944-foot peak of Mount Moran. Here in the mountain-rimmed Jackson Hole, the most dramatic scenery in America frames an area that was once the haunt of Indians and trappers. This 65,000-foot-high valley abounds in undisturbed wildlife, wild flowers, lakes and mountains, meadows, and forests. Although this area is one of the last remaining and surely the most beautiful outposts of the Old West, it can be reached easily and quickly by all forms of transportation.

The Nominations Committee presented its recommendations, which were unanimously accepted:

President: Howard L. Wilson
President-Elect: William A. Blueher
Vice-President: H. Carlyle Pollock, Jr.
Secretary-Treasurer: Eli H. Mullinax
Delegate to A. A. O.: Ernest T. Klein
Alternate Delegate to A. A. O.: J. Lynden Carman
Editor: Henry F. Hoffman
Assistant Editor: Oliver H. Devitt

LOUIS J. WILLIAMS

Letter from Charles B. Bolton

Because of the interest that Mr. Charles B. Bolton has shown in the growth of orthodontics, and because of his numerous contributions, it is thought that the following letter to the president of the American Association of Orthodontists will be of interest to the readers of the JOURNAL.

1800 Richmond Road
Cleveland 24, Ohio
September 22, 1958

Dr. C. Edward Martinek
Fisher Building
Detroit, Michigan

Dear Dr. Martinek:

The summer lapse into inefficient correspondence has passed and my apologies are forthcoming at the long delay in answering your kind and flattering letter of June 27th in connection with my election to Honorary Membership by the A. A. O.

My interest in your profession and my small contributions to the science of orthodontics have been a source of great personal satisfaction. This interest has become a nucleus around which my life seems to revolve. It has not only been a fascinating challenge, but also has proven a foundation of many lasting friendships.

If I have added only a small measure to the advancement and recognition of orthodontics, all the hours have been well spent and amply rewarded.

Please express to the membership of your association my humble thanks.

Sincerely yours,
CHARLES B. BOLTON

Dr. Alstadt Appointed to Arkansas State Board of Health

Dr. W. R. Alstadt, Little Rock orthodontist and president of the American Dental Association, has been appointed to the Arkansas State Board of Health for a three-year term. He succeeds Dr. Don M. Hamm, Clarksville, secretary-treasurer of the Arkansas State Dental Association.

Action on Jenkins-Keogh Bill Expected in New Congress

The Jenkins-Keogh measure, which would permit self-employed persons to set up their own retirement systems by placing a tax-deductible portion of their income annually into pension funds, is expected to be considered early in the new Congress which convenes next January. The measure was approved by the House of Representatives shortly before the last Congress adjourned. A last-minute effort in the Senate to attach the Jenkins-Keogh plan to another tax bill was voted down on a technicality. The progress toward achieving enactment of the measure was attributed in significant part to the hundreds of messages sent by constituent and component dental societies and individual members to their congressmen.

—*A.D.A. News Letter.*

Notes of Interest

Dr. Saul M. Bien announces the removal of his office from 654 Madison Ave., to 2 East 54th St., New York, New York, practice limited to orthodontics.

Louis E. Broverman, D.D.S., D.D.Sc., and Anthony J. Spadafore, D.D.S., M.S., announce a partnership for the practice of orthodontics, Central Union Trust Bldg., Wheeling, West Virginia.

Morton Cohen, D.D.S., announces the removal of his office to 1555 West Main St., Norristown, Pennsylvania, practice limited to orthodontics.

J. Ben Goldsmith, D.M.D., has discontinued his New York City office and will confine his practice to his Long Island office at Lawrence, New York, practice limited to orthodontics.

Louis B. Kelsten, D.D.S., announces that his practice is limited to orthodontics, Medical Tower, 31 Lincoln Park, Newark, New Jersey.

Emil O. Rosenast, Jr., D.D.S., formerly associated with Emil O. Rosenast, Sr., D.D.S., in the practice of orthodontics, announces that he will continue the orthodontic practice of the late Raymond T. Scull, D.D.S., at 134 North 8th St., Reading, Pennsylvania.

Beryl R. Sherman, D.D.S., 202 North Lime St., Lancaster, Pennsylvania, announces that his practice is limited to orthodontics.

Forthcoming meetings of the American Association of Orthodontists:
1959—Statler Hotel, Detroit, Michigan, May 4 to 7.
1960—Shoreham Hotel, Washington, D. C., April 24 to 28.
1961—Denver, Colorado.
1962—Los Angeles, California.

OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and its component societies. The Editorial Board of the JOURNAL is composed of a representative of each of the component societies.

American Association of Orthodontists
(Next meeting May 4-7, 1959, Detroit)

President, C. Edward Martinek - - - - - - - - - - - Fisher Bldg., Detroit, Mich.
President-Elect, George M. Anderson - - - - - - 3700 N. Charles St., Baltimore, Md.
Vice-President, Ernest N. Bach - - - - - - - - - Professional Bldg., Toledo, Ohio
Secretary, Earl E. Shepard - - - - - - - - - - - 8230 Forsyth, St. Louis, Mo.

Central Section of the American Association of Orthodontists
(Next meeting Sept. 28 and 29, 1959, Chicago)

President, John R. Thompson - - - - - - - - - 55 E. Washington St., Chicago, Ill.
Secretary-Treasurer, William F. Ford - - - - - - - 575 Lincoln Ave., Winnetka, Ill.
Director, Elmer F. Bay - - - - - - - - - - 216 Medical Arts Bldg., Omaha, Neb.

Great Lakes Society of Orthodontists

President, Edwin G. Flint - - - - - - - - - 8047 Jenkins Arcade, Pittsburgh, Pa.
Treasurer, D. C. Miller - - - - - - - - - - 40 South Third St., Columbus, Ohio
Director, Robert E. Wade - - - - - - - - - - 327 E. State St., Columbus, Ohio

Middle Atlantic Society of Orthodontists

President, Gerard A. Devlin - - - - - - - - - 121 Prospect St., Westfield, N. J.
Secretary-Treasurer, Paul A. Deems - - - - - - - - 835 Park Ave., Baltimore, Md.
Director, George M. Anderson - - - - - - - 3700 North Charles St., Baltimore, Md.

Northeastern Society of Orthodontists

President, Walter R. Bedell - - - - - - - - 49 Market St., Poughkeepsie, N. Y.
Secretary-Treasurer, David Mossberg - - - - - 36 Central Park S., New York, N. Y.
Director, Norman L. Hillyer - - - - - - - 230 Hilton Ave., Hempstead, L. I., N. Y.

Pacific Coast Society of Orthodontists

President, Richard Railsback - - - - - - - - 1333 Grand Ave., Piedmont, Calif.
Secretary-Treasurer, Warren Kitchen - - - - - 2037 Irving St., San Francisco, Calif.
Director, Richard Railsback - - - - - - - - - 1333 Grand Ave., Piedmont, Calif.

Rocky Mountain Society of Orthodontists

President, Howard L. Wilson - - - - - - - - 1107 Republic Bldg., Denver, Colo.
Secretary-Treasurer, E. H. Mullinax - - 209 Lakewood Medical Center, Lakewood, Colo.
Director, Ernest T. Klein - - - - - - - - - Republic Bldg., Denver, Colo.

Southern Society of Orthodontists

President, John A. Atkinson - - - - - - - - 898 Starks Bldg., Louisville, Ky.
Secretary-Treasurer, H. K. Terry - - - - - - - 2742 Biscayne Blvd., Miami, Fla.
Director, Edgar Baker - - - - - - - - - Professional Bldg., Raleigh, N. C.

Southwestern Society of Orthodontists

President, Thermon B. Smith - - - - - - - - 1122 W. Capitol, Little Rock, Ark.
Secretary-Treasurer, Harold S. Born - - - - - - 908 S. Johnstone, Bartlesville, Okla.
Director, Nathan Gaston - - - - - - - - - 701 Walnut St, Monroe, La.

American Board of Orthodontics

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Vice-President, L. Bodine Higley - - - University of North Carolina, Chapel Hill, N. C.
Secretary, Wendell L. Wylie - - - - - University of California School of Dentistry, The Medical Center, San Francisco, Calif.
Treasurer, Jacob A. Salzmann - - - - - - - - 654 Madison Ave., New York, N. Y.
Director, B. F. Dewel - - - - - - - - - - 708 Church St., Evanston, Ill.
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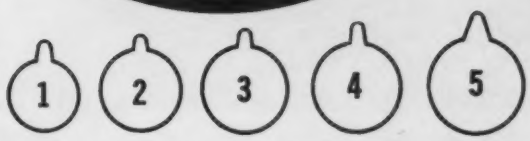

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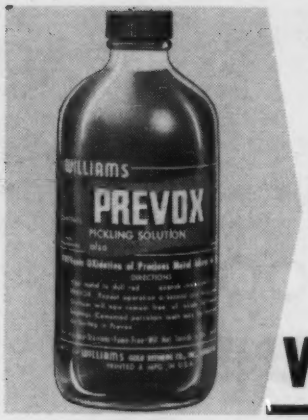

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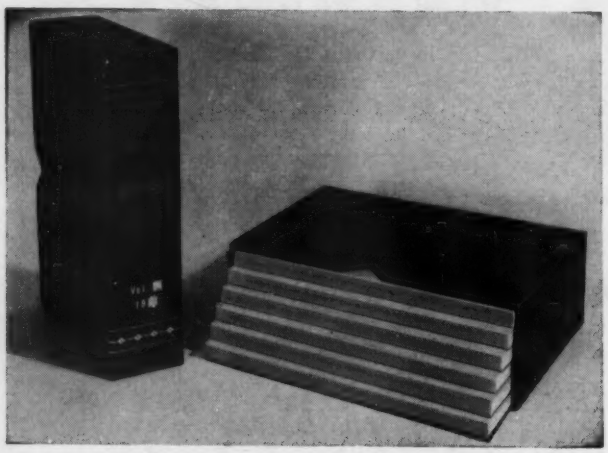

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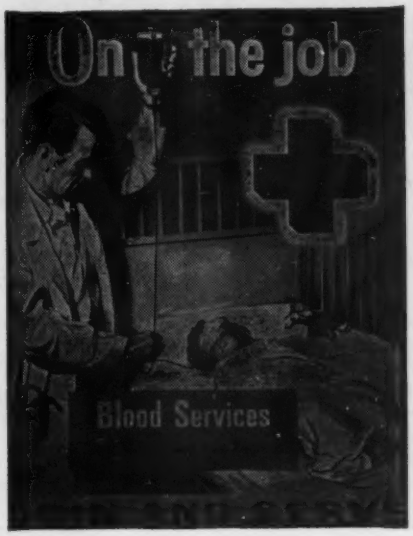

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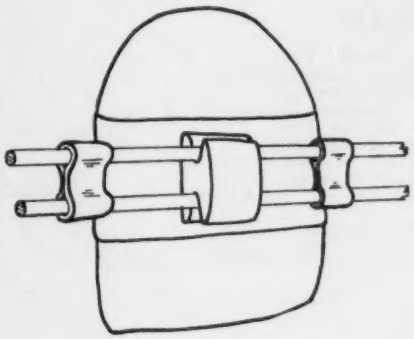

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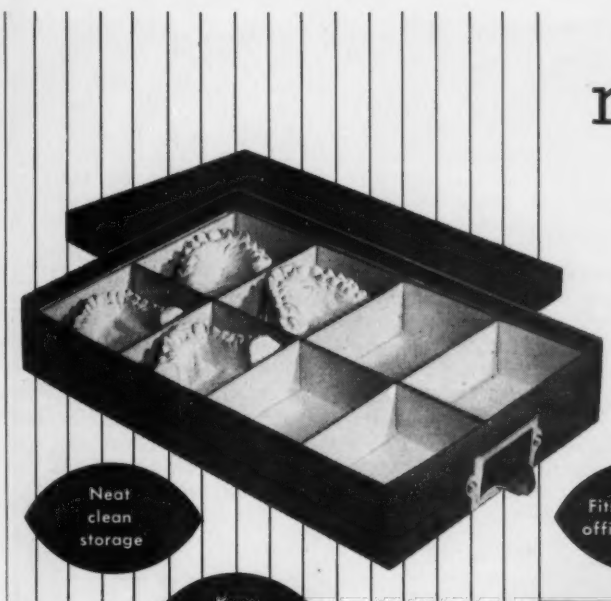

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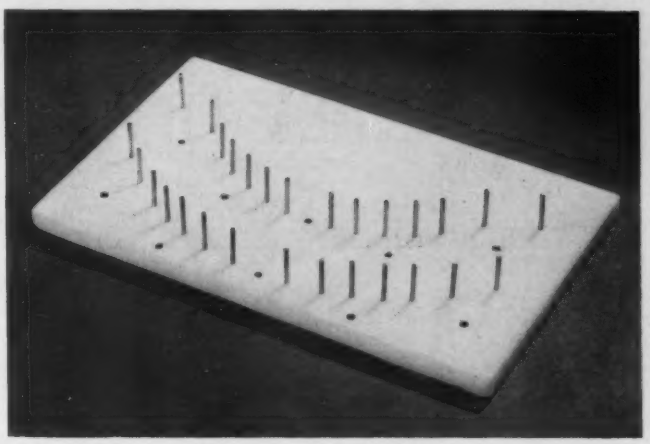

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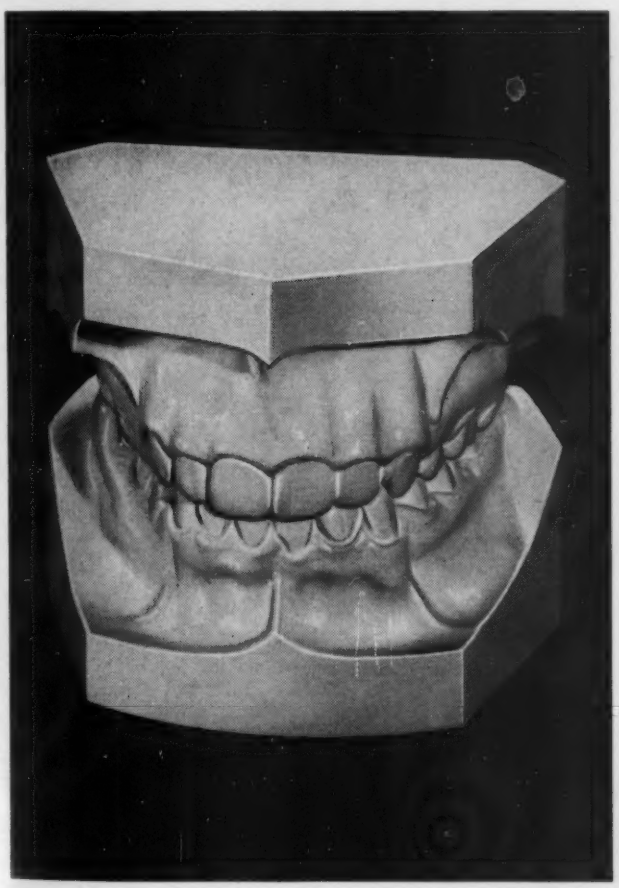

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